NOV 11 1933

NINETY-NINTH YEAR OF SERVICE TO THE METAL WORKING INDUSTRY

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THE IRON AGE

DUCTION -:- MANAGEMENT NOVEMBER 9, 1933 PROCESSES -:- NEWS

THE HAMMER

Must Replace the Chisel

★ Times have changed, and sales tools must be changed with them. ★ The price chisel is out. Its edge has been dulled by codification. ★ The price chisel has always been a crude and dangerous tool. It was used in the dark and often cut the fingers of its user. ★ The sales hammer, which does its work by repetition, instead of injuring its user builds his sales muscles and skill. ★ Your sales hammer is *constructive advertising*. It drives home the proof of merit of your product and its forceful, repeated blows rivet the attention and interest of your sales prospects.

WHY PAY THE PRICE OF INDIFFERENCE?

"WOULD I CHANGE THINGS IF I WAS BOSS? ...OH, MISTER!"

INEFFICIENCY can be either a big word discussed in the front office or a big opportunity for savings out in the plant. Inefficiency . . . wasted man-hours . . . is something very real to the men whose hours are wasted.

If you want to be sure of rock bottom production costs, ask your machine operators for suggestions. If they recommend modern Motor Control, investigate sincerely. Possibly your plant, too, is paying a staggering penalty for indifference toward Motor Control.

Motor Control is far more important than its size or cost indicates. It is the one link between human intelligence and motorized machines. It is a factor in the speed and dependability of production, the quality of workmanship, the cost of power and maintenance, the safety of men, motors and machines.

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CUTLER HAMMER

The Control Equipment Good Electric Motors Deserve

(A-8021)

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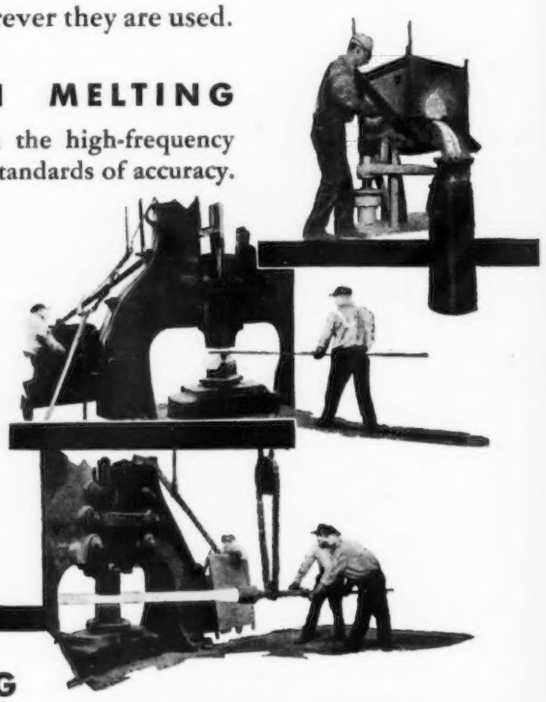

LIBERAL INGOT DISCARD

Large discards, from both the top and bottom of the ingot, mean that the buyer gets only the "cream" of the tool steel.

HAMMER-COGGING OF INGOTS

It's far costlier to hammer-cog ingots than to roll them. But the tremendous impact developed under the 14,000-lb. hammer insures a complete working of the entire ingot and the breaking up of all undesirable ingot structure.

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Thoroughly representative cross-sections for inspection are obtained by cutting slabs from the tool-steel billet stock before rolling, and cutting discs from the finished bars.

These samples are subjected to hot-acid etch, hardenability tests and microscopic examination.

BETHLEHEM STEEL COMPANY

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BETHLEHEM TOOL STEELS

▲▲▲ THE IRON AGE ▲▲▲

NOVEMBER 9, 1933

ESTABLISHED 1855 Vol. 132, No. 19

Self-Government in Industry

AMERICAN society has survived because there are at least nine white sheep to one black one. Nine out of ten Americans are willing to live and let live, to respect their neighbors' rights as well as to insist upon their own.

It is because of this fact that government can exist. Imagine what would happen if the proportions were reversed!

Our Constitution builders recognized this fact and also that the more directly the will of local majorities can be expressed in terms of government, the more readily can it be made effective and the better will the results fit particular conditions. Therefore, in emphasizing State rights in the Constitution, they stressed the cardinal virtues of decentralized control. These clear thinking statesmen realized the dangers in a centralized Federal bureaucracy. They had at hand the examples of France and Russia, which seethed with social unrest and were permeated with espionage.

THE control of industry is much more difficult and complex than the control of human affairs that has heretofore been exercised by governments. To attempt it under a centralized and all-powerful bureaucracy, as NRA has tended to become, is to sow discontent and to reap failure.

Mr. Swope's suggestion to decentralize industry control and to divorce it, so far as possible, from governmental aegis, is a step in the right direction. The properly motivated majority existing in each industry can be best looked to to exercise the necessary control, if put in position to do so.

ANOTHER suggestion that may be worth considering is to simplify the aims of industry control to the point of immediate feasibility. Ten years from now we may have learned enough about mass industrial economics to be able to build and operate the delicate control mechanism required to preserve the desired balance between the complicated and multiplex factors of supply and demand, of wealth, currency, wages, volumes and investment. Today, we are in the position of the country blacksmith attempting to make a Swiss watch. The will may be there but the skill is absent.

Ford Makes Starters and Generators in M

By BURNHAM FINNEY

HENRY FORD has long held the conviction that the break-up of large concentrated industrial units is a concomitant of recent changes in our economic life. In place of a gigantic plant with tens of thousands of workers living in congested areas nearby, there will be a hundred small factories located in or near villages each employing 25 to several hundred workers. Such an arrangement will give factory employees an opportunity to live in houses of their own with garden plots or small farms adjoining them on which they can raise part of their food, and to bring up their families in healthful surroundings.

Over a period of years Mr. Ford has put his theory into practice by erecting six small plants along the River Rouge, each making parts for the Ford car. Recently he has constructed a seventh plant at Ypsilanti, Mich., on the Huron River; this employs 400 men and has capacity to manufacture 6000 starters and generators every 16 hr. for Ford V-eight cars.

Like the other small Ford units, the Ypsilanti factory has a hydroelectric power plant. The factory itself is 160 x 390 ft. and is equipped with the most modern machinery, a considerable amount of which has been designed by Ford engineers. Overhead conveyors are ingeniously employed to carry materials from one operation to the next. Floor space is economically utilized. As in all other Ford plants, cleanliness and neatness are stressed. Above all, the fact has been fully recognized that efficient, low-cost production is dependent upon machine tools of latest design. From the standpoint of the factors enumerated, the plant might well be studied as a model for small manufacturers.

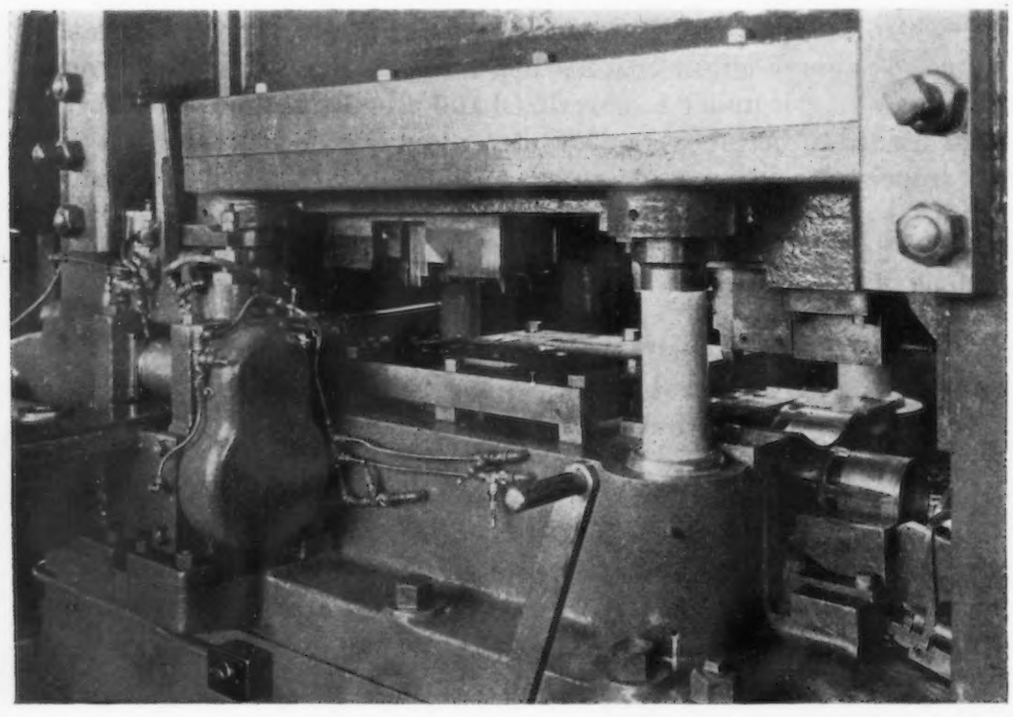
Frames Formed in Automatic Press

Starter and generator frames are formed in a 500-ton automatic press equipped with progressive dies. Skelp stock 5½ in. wide, 12 ft. long and ⅜ in. thick is fed into the press through a roll feed. Successive operations are cutting to length, piercing the windows, beveling the ends, first bend, second bend and final bend. At the end of the forming process the frame is ejected from the press.

The press is of high-speed double-crank type powered by a 50-hp. motor. It is double-geared with the gearing completely inclosed. The crankshaft is 11 in. in diameter at the main bearings and 15 in. at the crankpins. The press is lubricated by a forced-feed automatic oiling system. The automatic roll feed is equipped with safety pins to prevent breakage in case the stock should become jammed in the machine. Air cylinders on top of the press serve to cushion the ram. Scrap falls through the dies on to a conveyor underneath the machine. A ratchet device moves the conveyor at each stroke of the press. The press operates at a speed of about 20 strokes a minute.

Edges Continuously Arc Welded

After being formed, frames are kicked automatically into a chute and travel by gravity along a conveyor to an automatic welding machine in



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Starter and generator frames are formed in a 500-ton automatic press equipped with progressive dies, and a roll feed. Press operations consist of cutting to length, piercing windows, beveling ends, first bend, second bend and final bend. The press makes 20 strokes per min.

ors in Model Small Plant

MAKING starters and generators for V-eight cars, Henry Ford's small plant at Ypsilanti, Mich., is a model which other manufacturers might profitably study. Its equipment, including several Ford-designed special machines, is modern in every respect, floor space is economically utilized, conveyors ingeniously employed, working conditions ideal for operators. Stamping, welding, machining, soldering, baking and testing operations are outlined in this article. Of particular interest is the continuous mill employed for rolling copper bars into strips.

which the two edges are welded together by the "electronic tornado" carbon arc process. The blanking operation leaves a slight gap between the edges to provide for guiding the frames under the arc. Just before the frames reach the automatic welder, they are picked up from the conveyors by driving rolls which take them underneath the arc. As the frames are butted tightly together, the arc is not destroyed, but goes from one frame to the other, making a continuous seam. The welded frame is broken off by a trip, and falling into a conveyor which carries it to the next operation.

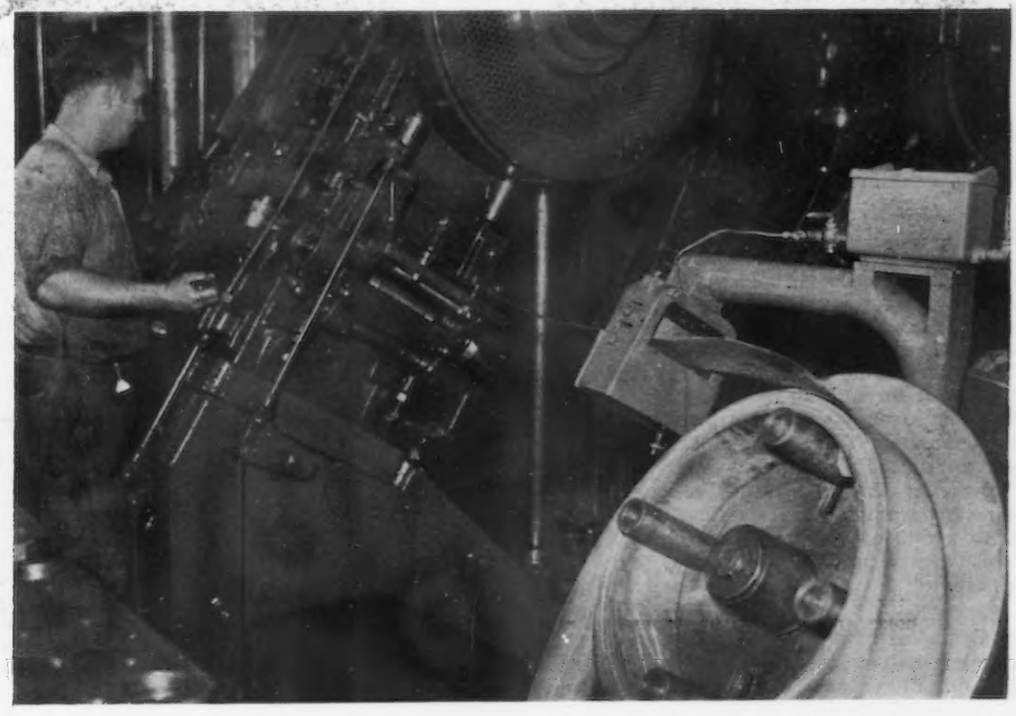
Approximately 350 amp. at 40 volts across the arc is used for the welding. At the time of welding, a fibrous autogenizer is automatically fed past the incandescent carbon. This autogenizer is a chemically treated fibrous cord which, in burning, liberates gases that form a protective envelope around the molten metal, preventing formation of oxides and making possible a weld having high ductility and high tensile strength. About 240 frames an hour are welded in this machine.

Inside Diameter Is Broached

About 0.104 in. of material is removed from the inner diameter of the frame on a special 30-ton duplex broaching machine. The hole in the frame is 3.873 in. in diameter and the length of the frame 5½ in. The broaches consist of a series of high-speed steel shells mounted on hardened and ground arbors. The machine, which is fully automatic, is built in two units, each of which is independent of the other.

The operator places frames in the work chutes shown in the accompanying illustration, keeping them well filled. A hydraulically-operated table picks up a frame and sets it in the working position. The table, which controls the broach elevator ram, automatically trips the controlling valve for the lower elevating ram, causing the broach to rise rapidly and push the shank through the frame. The pulling ram, which seizes the broach, is equipped with automatic connecting chucks. As soon as the broach is raised to the proper height for connection in the automatic pulling chuck, the lower broach elevator trips the valve which starts the pulling ram on its upward or cutting stroke.

As the broach passes through the work, having advanced about half the length of the broach, the work feed slide withdraws automatically into position to receive another frame from the chute. When the tool completes its cutting stroke, the broached frame drops off on to two angle bars and slides out the side of the machine into a receptacle. At the same time the pulling ram reverses, going back to its starting position, and the automatic pull chuck releases, allowing the broach to move back into the receptacle provided for it on the lower



Rotor laminations are pierced and blanked in high-production presses equipped with compound dies. Reels of special 24-gage, hot-rolled electrical strip steel are placed on reel holder and fed into oil rolls. The stock then goes through a feed and straightening roll into the press, which makes 140 strokes per min.

broach elevator. The elevator then withdraws to its lowest position and the machine starts another cycle.

Frames Faced and Chamfered

The broaching machine has two oil reservoirs and two hydraulic systems. The oil pump is driven by two 40-hp., 1200-r.p.m. motors. Lubricant is piped not only to the broach, but also to the base of the machine, which it floods, causing the chips to be washed to the center of the base. A screw conveyor carries the chips to the rear of the machine where they are discharged into a container. All movements of the broaching machine are interlocked, each unit having to complete its movement before the next one will function. The machine broaches five frames a minute.

Both ends of the frames are faced and chamfered in a six-spindle horizontal chucking machine which has automatically operated expanding arbors, two cross-slides and five longitudinal-feed slides. The machine is equipped with magazine feed and automatic unloading device. Frames are fed into it through an inclined magazine, loaded on expanding arbors, indexed through four cutting stations and an unloading station. Scrap is thrown out at the rear of the machine, by means of an automatic wiper, on to a chip conveyor. The machine faces and chamfers six frames a minute.

Seven holes in the starter frame are drilled and two slots are milled on a rotary indexing vertical-type drilling and milling machine. Production on this machine amounts to seven frames a minute.

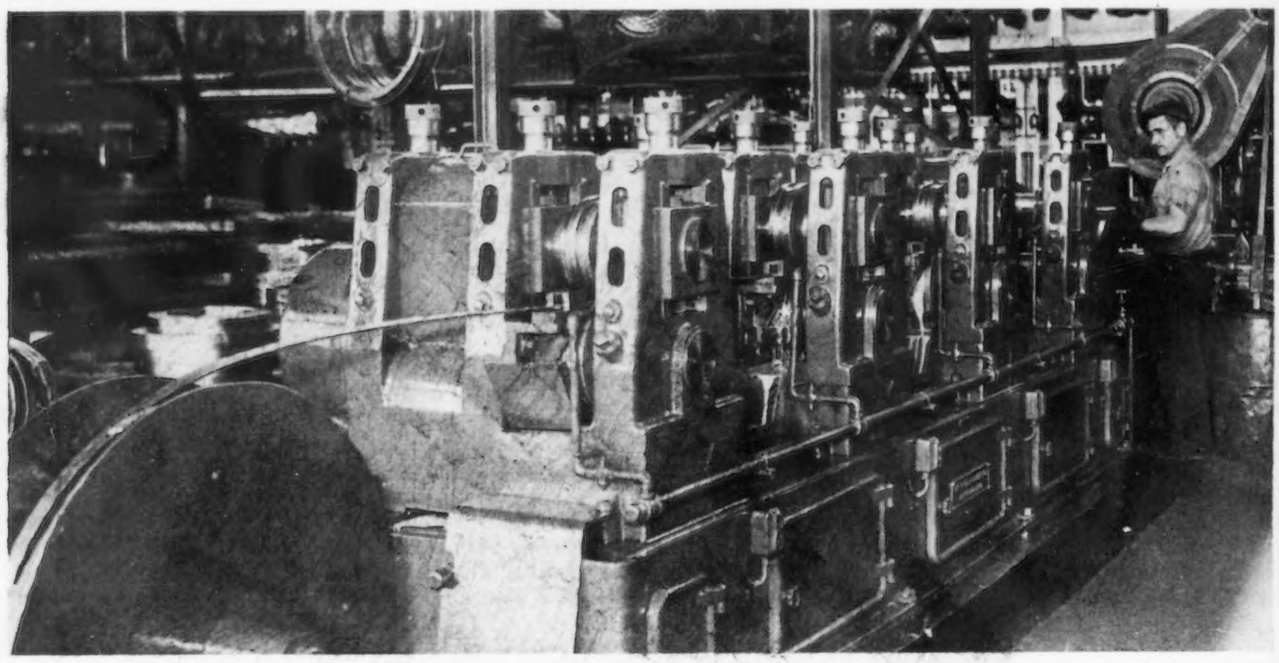
Rotor Laminations Produced on High-Speed Presses

Rotor laminations for the generator and starter armatures are pierced and blanked on a battery of automatic-feed high-production presses equipped with double compound dies. These presses operate at a rate of 140 strokes per minute. For this work special 20-gage hot-rolled electrical strip steel 5⅜ in. wide is used. The steel comes into the plant in reels weighing about 250 lb., each of which are placed on reel holders. From the reel the steel is fed into two oiling rolls where it is coated with a film of oil. The rolls are lined with felt, the oil dripping on to the felt from the end of a feed line and the felt in turn transferring the oil to the steel. The oil flows by gravity through the feed pipe from a reservoir nearby which is filled by hand twice a day.

From the oiling rolls the stock goes through a feed and straightening roll into the press. There are two sets of these rolls so that the press blanks out two laminations at each stroke. As the blanks emerge from the press they feed on to a rod which, when filled, is hung on an overhead conveyor and carried to the assembly station. The scrap steel from the press is cut into pieces 2½ in. long by a scrap shear on the machine, the scrap dropping on to an endless conveyor which takes it to a baling press. The baling press is in a pit, with its top level with the factory floor, thus saving considerable production space.

When a stack of laminations reaches the assembly station, it is put in a vertical magazine and measured. The operator pulls a handle on the magazine, ejecting a specified number of laminations necessary for an armature. He then weighs them to see that the amount is correct. The stack is put on a shaft and inserted in the loading station of a rotary hydraulic core assembling machine designed by Ford engineers.

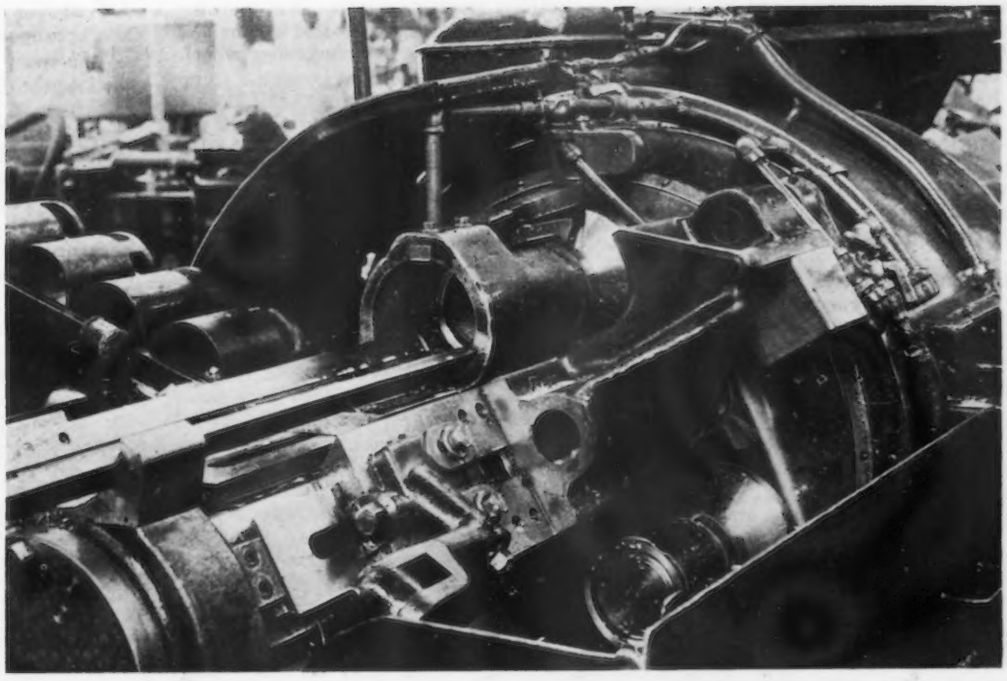
This machine has three stations and works automatically, turning out seven assembled cores a minute. The first operation consists of pressing the burnishing pins into the lamination slots. The second is to press the shaft in place, and the third to press out the burnishing pins. In the first operation an upper cylinder moves down on a stack of laminations, a lower cylinder at the same time moving up the burnishing pins into the slots. The same cylinder cycle is repeated during the second operation, but in the third operation a compound cylinder functions.



V-shaped commutator segment bars are rolled into strip at rate of 22 ft. per min. in one pass. Each set of rolls is driven by an individual variable-speed motor.

Generator Shaft Is Centerless Ground

The generator shaft is rough ground on a No. 3 centerless grinder with a tilting regulating slide. The slide is operated by a cam properly timed with the loading fixture, which likewise is cam-operated. The tilting and loading mechanism is driven by a 1-hp. motor. The grinding wheel, regulating wheel and work blade are profiled to the shape of the generator shaft.



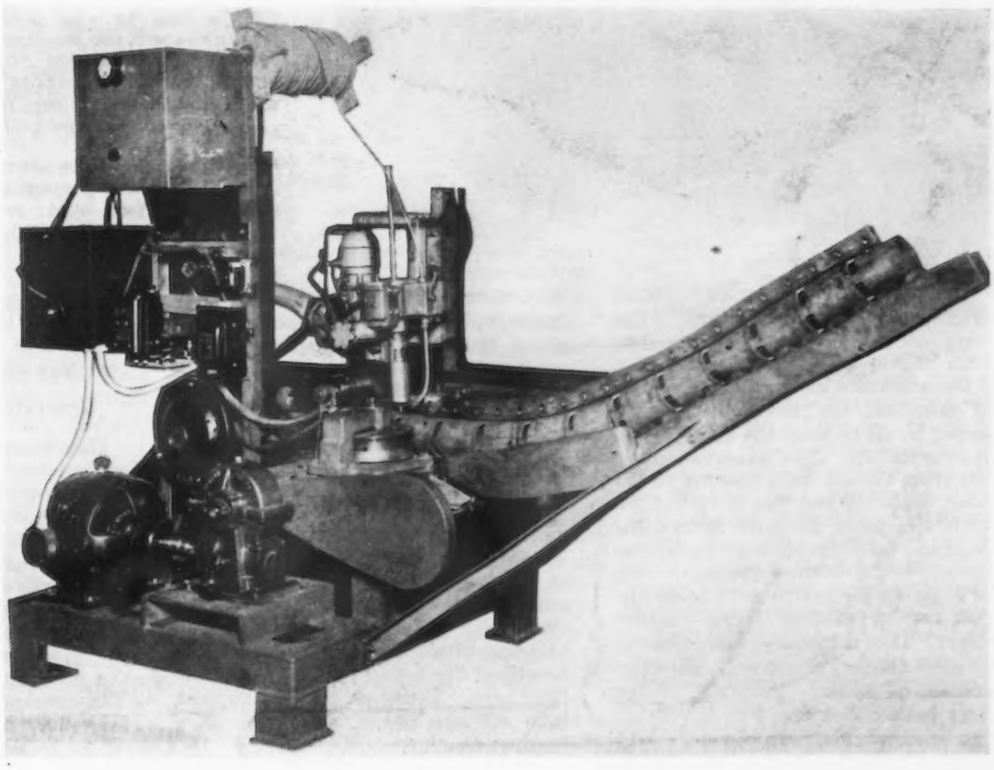
Both ends of frames are faced and chamfered in a six-spindle chucking machine which has automatically-operated expanding arbors, two cross-slides and five longitudinal-feed slides. The machine is equipped with magazine feed and automatic unloading device.

The operator loads the shaft in a chute which is so designed that the work can be inserted only in one direction, since one end of the two bearing diameters of the shaft is longer than the other. The loading pusher brings the shaft between the wheels, the regulating slide tilting rapidly toward the grinding wheel and then slowing down to the grinding speed. While the shaft is being ground, the loading pusher returns to pick up the next shaft. The tilting or infeed cycle is six shafts per minute.

After the shaft is ground, the regulating slide drops back and the locating stop disappears. The loading pusher shoves into place the next shaft, at the same time ejecting the ground shaft, which slides down a chute at the back of the machine. As the loading chute holds about 15 shafts, the operator has ample time to inspect the work. Production on this machine averages 325 shafts an hour with a stock removal of 0.010 to 0.012 in.

The two ends of the shaft are finish ground on a centerless grinder equipped with tilting and loading devices similar to those on the machine for rough grinding. From 0.002 to 0.003 in. of stock is taken off in the finish cut. The finish on the diameters is high and limits are held to less than 0.0005 in., which the operator checks with a snap gage.

Both rough and finish grinding machines are equipped with profile hydraulic truing attachments for the grinding and regulating wheels. The mechanism controlling the grinding,



The two edges of the starter and generator frame are welded together in an automatic carbon arc "electronic tornado" welding machine. Just before the frames reach the machine, which is in continuous operation, they are picked up from the gravity conveyor by driving rolls which take them underneath the arc. In operation, the machine is inclosed in a hood.

the loading fixture and the tilting slide is arranged for single or automatic cycle operation, thus permitting the operator to check the set-up a shaft at a time. If he finds everything correct, he can push a button and the machine operates automatically. The method of grinding the shaft assures accurate alinement of all diameters and substantially decreases production costs.

Commutator Leads Soldered on Ford-Designed Machine

Leads of commutators on the starter and generator armatures are soldered in a rotary electric soldering machine designed by Ford engineers. The armatures are suspended from collets which travel on an overhead track. As the armature moves into the soldering machine, the shaft tip is submerged in oil to keep the solder from clinging to it. The armature then rises from the oil bath, passing to the solder bath. When the fixture from which the piece is hung lowers the armature into the solder bath, the pinion in the fixture meshes with the rack on the machine, causing the armature to revolve slowly in the solder. This distributes the heat in the commutator, permitting the commutator to solder. The heat of the solder bath is 600 deg. F.

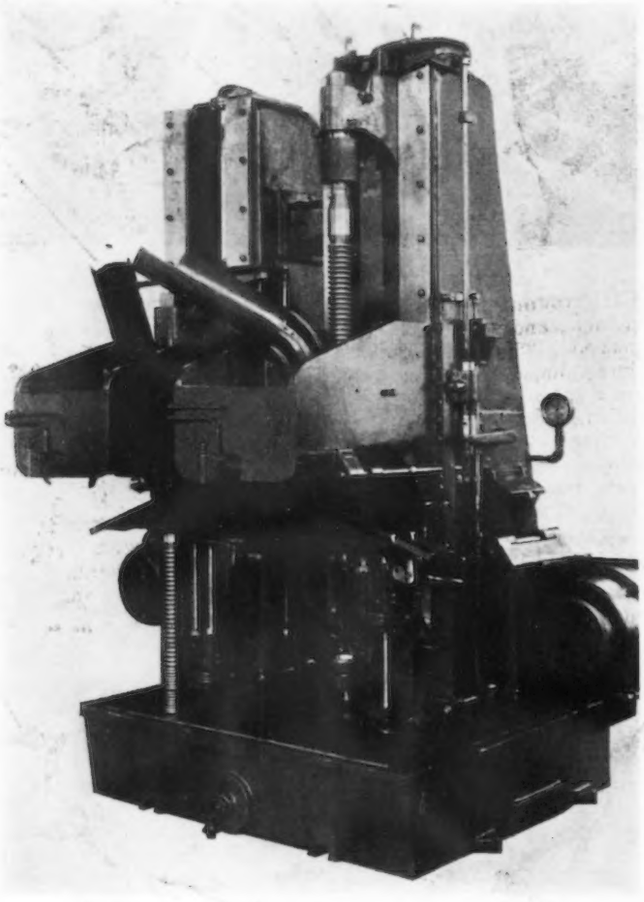
As the work comes out of the solder bath, it rises on a cam. An operator removes the armature and cleans the shaft tip with a felt revolving wheel, hanging the work on a conveyor to go through the varnishing and baking process. Armatures pass through the soldering machine at the rate of 20 a minute. The machine is operated by a 1-hp. motor mounted on the top. Operation of the soldering cycle is automatic.

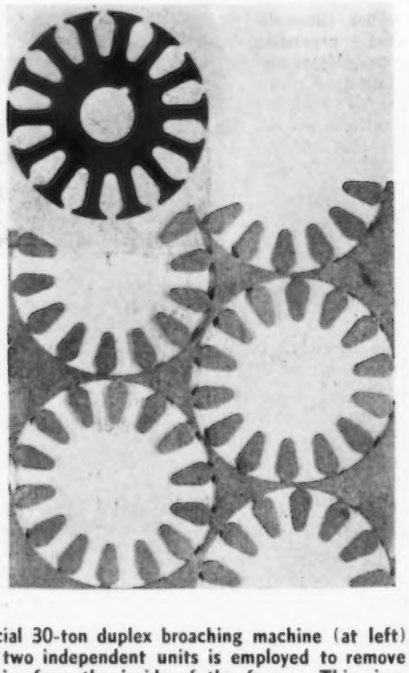
Varnished Armatures Baked in Heat-Controlled Ovens

Generator and starter armatures are given a coat of insulating varnish in a special glass-inclosed room, the temperature of which is maintained at about 100 deg. F. Armatures, on an overhead conveyor, are dipped for 2 min. in a varnish tank and then go to a baking oven of special design located on a mezzanine floor.

This oven is fired either by fuel oil or by electricity, the latter when the hydro-electric plant is running, and at other times by automatic oil-burning equipment. Air for the oven is drawn through an air conditioner and then blown over hot tubes into the oven. The heated air enters the oven through intake pipes that extend the length of the center of the oven at the floor level. Vents on top of the oven take off any fumes by means of a natural draft.

Conveyor tracks carrying the work are arranged to secure maximum use of the oven space, four tracks going the length of the oven at a lower level and four at a higher level. The conveyor sprocket bearings are cooled by water jackets built around them. Expansion joints at each U turn of the conveyor take care of expansion and contraction of the steel as the temperature in the oven increases or diminishes. Expansion take-ups are also located back of each three-motor drive for the conveyor. All drives are equipped with shear pins. Marine lights are installed in the oven to give the operator a clear view of the work. The oven heat is automatically controlled and recorded by means of pyrometers and recording instruments.





A special 30-ton duplex broaching machine (at left) made up of two independent units is employed to remove about 0.104 in. from the inside of the frame. This view shows the machine with chip hood removed, one broach at bottom position ready to start the cutting cycle, and other having completed broaching, awaiting return of ram. Broaches consist of series of high-speed steel shells mounted on hardened and ground arbors.

At top is rotor lamination and below is scrap resulting from piercing and blanking operations on the high-production presses. The press blanks out two laminations at each stroke, turning out 280 laminations per min.

Generators Tested on Conveyor

Generators are motor tested on a continuous conveyor. Three generators are placed on a rack running crosswise of the conveyor. The rack has a contact brush which contacts a hot rail charged with electric current of 10 volts and which extends the length of the conveyor. When the rack reaches the end of the conveyor, the electrical contact is broken and the generators are removed by hand. The current for the testing work is furnished by a motor-generator set

(Concluded on page 60)

A Power Famine—Fact or Fiction?

By A. T. GARDNER
Utilities Power & Light Co., Chicago

IS a power famine imminent? Will the electrical industry be unable to meet the increasing demands for electricity which will develop as industries once more begin to produce at something approaching normal? This is a problem which faces every industrial company using electricity, and every public utility company supplying such service.

In recent months a number of articles have appeared discussing this vital subject and suggesting ways in which manufacturers can meet the assumed problem it presents (see *Electrical World*, July 1, 1933, and IRON AGE, Oct. 5, 12 and 17, 1933). The fundamental thesis of these articles is that there is an immediate danger that the electrical industry has insufficient generating capacity to meet the power requirements of an expanding industry.

The arguments underlying this assumption may be outlined briefly as follows. Since 1929 the total connected load attached to the power lines of the companies has increased by approximately 42 million kw. Of this increase about 20 million additional kw. is attributed to the purchase of motors, heating devices and welding apparatus by industrial concerns, about 11½ million kw. to the purchase of appliances such as electric clocks, vacuum cleaners, irons, percolators and refrigerators by residential users of electricity, and 10 million additional kw. due to the purchase of additional lamps. It has been assumed that this additional load would call for an additional generating capacity of something over 4 million kw. During this same time the electric light and power companies have added almost 4½ million kw. additional capacity to their plants. Thus, the increased load added since 1929 would, according to these estimates, just about be handled by the additional facilities provided. At the same time the "use factor," or the amount of current used as compared to the available output if the plants were operated continuously at 100 per cent capacity, dropped from about 37½ per cent in 1929 to about 28 per cent in 1932. Due to the operation of the NRA, and other unnamed factors, it is contended that conditions all tend to establish a 30 per cent use factor as a safe and reasonable ratio between the actual output and total possible available output.

It is pointed out that in view of the above the utilities at any moment will begin to place restrictions on the users of current, who either have a high demand in proportion to the amount of current they use, or have a low power factor. At the same time it is urged that the manufacturer who buys current from central stations should immediately take steps to determine how he can obtain a supply of electricity when the utility companies have no more power to sell.

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IN this article we have an electric power utility executive's reaction to the question of an impending power shortage. It is an answer to the three articles recently published in THE IRON AGE which presented data to show that electric power resources may be insufficient to provide for a substantial pickup. The author agrees with Mr. Juraschek that industrial operators should carefully study economies in current use, but holds that central stations are fully equipped to handle any probable future demands.

▼ ▼ ▼

That the users of current should take every step to make efficient use of the electricity they buy and should, if possible, so regulate their use so as not to create heavy demands for short periods is obvious, if only from the point of view that such procedure will be immediately reflected in lower power bills. That the utility companies are not prepared to take on any load which will likely be imposed upon them by industrial users, in the near future, is an assumption which seemingly is unwarranted by the facts in the case.

In any discussion of the ability of the power plants of the country to meet such demands as are likely to be put on them in the near future, it is important that a number of factors be given consideration. These considerations might be outlined as follows:

(1) The total available capacity of the generating stations of the country.

(2) The total amount of current which these plants are likely to be called upon to supply.

(3) The probable distribution of this load throughout the day, the week, the month, or year.

(4) The efficiency with which industrial companies are likely to use the current supplied to them.

At Dec. 31, 1929, the total generating capacity of the country was approximately 29½ million kw. and by Dec. 31, 1932, this capacity had been increased to almost 34 million kw., a total increase of almost 4½ million kw. or 15 per cent. During this same time industrial production declined about 40 per cent, many plants were closed and in some cases abandoned, industrial construction was practically at a standstill, and the consumption of electricity for large light and power purposes dropped from over 44 billion kwhr. to about 31 billion kwhr., a decline of 30 per cent. Although sales to residential consumers increased somewhat during the period the decline in industrial use caused a falling off of total output from over 90 billion kwhr. to less than 83 billion kwhr.

In attempting to determine the total amount of current which the utility companies are likely to be called upon to supply it is necessary that consideration be given to the amount of electrical equipment which has been added to the lines since 1929. As has been previously stated, it is estimated that approximately 42 million kw. connected load has been added since 1929 which in turn would require an estimated increase in capacity by central stations of over 4 million kw. It is believed that these estimates can be seriously questioned on the following basis. It was estimated that the sales of industrial motors, heating equipment and electrical equipment have added something over 20 million kw. to the total connected load. However, no consideration seems to have been given to the fact that during this time a considerable amount of equipment must have been worn out, or have been rendered obsolete and thus retired. This same argument may be applied to the estimate that over 11½ million kw. connected load was added due to sales of household appliances. Electric irons, washing machines and toasters have long lives but they wear

(*Concluded on Page* 62)

How Attractive Finish Helps M

HOW is the manufacturer of a metal product to know just which one of the myriad of available finishes will be best suited to his product? Some of the questions frequently expressed by executives are: "Shall we plate or enamel our new adding machine?" "Can we draw umbrella handles out of steel sheets which already have a finish coating without having the coating injured?" "What finish shall we use on washing machines, tobacco cans, humidifiers, or metal waste baskets?"

This is the second of a series of articles under the general heading "How Attractive Finish Helps Metal Products Sales." Subsequent articles will deal with cleaning, pickling, plating, galvanizing, enameling, and polishing. In the present article some of the difficulties in solving the problems of selection are pointed out and a few of the amazing new developments in metal finishing are described.

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A PIECE of plain cold rolled steel might make a suitable toaster as far as toasting bread is concerned, but few people would buy it because it lacks attractive appearance. The same toaster made with nickel or chrome plated steel is an entirely different item from the sales point of view. Similarly, a piece of plain black stove pipe vents gases effectively, but nickel-tin or chrome-tin pipe gives the added touch desired by the discriminating home owner. These are self-evident examples in the manufacture of metal products. It is the less obvious cases that often puzzle or baffle executives responsible for sales volume. "Shall we plate or enamel our new adding machine?" "Can we draw umbrella handles out of coated steel sheets?" "What finish shall we use on washing machines, tobacco cans, humidifiers, or metal waste baskets?" These are the questions which call for a knowledge of available finishes and their relative costs as well as a sense of that highly elusive quality "public fancy."

The manufacturer of metal furniture must consider the advantages and disadvantages of dipping, spraying, flocoting, silk screening, coating with a composition roll or a coating machine, tumbling, and brushing. And the manufacturer of almost any metal product should know a great deal about the various prefinished sheets, strip, and wire which he can buy and which can be fabricated without marring the surface. One of the most interesting and far-reaching developments in metal finishes is an enamel which will stand up under severe forming. An example of this is the familiar metal drugstore bottle cap. These caps are manufactured out of enameled sheet stock which is blanked and formed without injury.

Many other types of finish are proof against some forming of fabricating processes. One case of this sort is the familiar metal snap case for eye glasses. This is frequently lined with plush or felt and one of the largest manufacturers buys plush-coated sheets and then does the required stamping and finishing without injury to the plush. The problem of an attractive appearance often is greatly simplified when coated or plated sheets can be used.

Wood Grain Finish

The wood grain finish on metal received its greatest impetus in connection with a sales development program of the National Cash Register Co. Some years ago when the usual finish of a cash register was a bright nickel, one important customer who was fixing up luxurious offices asked for a good job of imitation wood grain finish on his order of cash registers. Shortly before this the Von Webern graining process had been developed and it was used in filling this order. Previous to the Von Webern method, most wood graining was a hand operation. A familiar instance of this hand

Furniture panels of metal are made not only to accurately imitate the appearance of wood, but also to feel like wood and to sound like wood

Metal Products Sales

By HERBERT R. SIMONDS

II.—The Problem of Selection

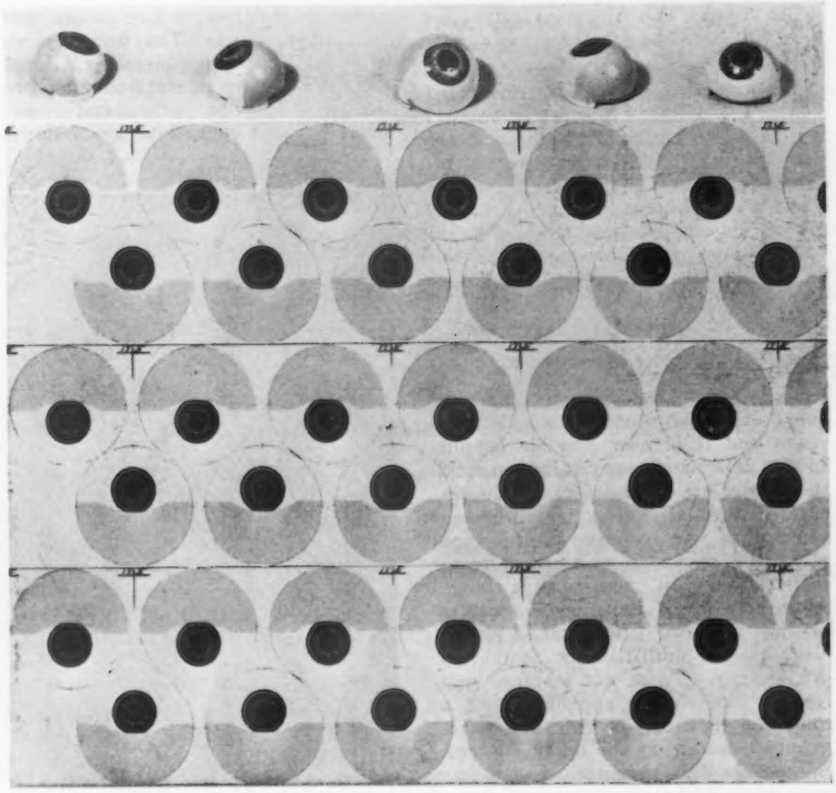
process was seen in the finishing of Pullman cars built at about that time. The new process transferred the design photographically from actual examples of wood grain to rolls and finally to the metal while still in the form of flat sheets.

The finish on this first order for office furniture proved so attractive that the National Cash Register Co. started using it as its chief finish for its complete line, even though this meant some radical changes in design. Heretofore the registers had been made largely of castings which were embossed and nickel plated. The wood grain finish cost slightly more than the nickel plate, but this was more than offset by the saving through the use of rolled steel products and by the increased appearance value. An interesting collateral development in finish occurred in the case of both wood and metal tables and stands used for supporting registers. A manufacturer of wooden tables was so pleased with the new National Cash Register wood grain finish on metal that he used the same finish on wood. He made his tables of birch, covered them with a ground coat, and then applied the imitation wood grain on top of that. The technique of photographic copying has been so developed that accurate replicas of wood grain finish and of marble are relatively inexpensive to produce. Several methods are offered for reproducing wood grain on metal. So natural are some of these that metal paneling and wainscoting are being used in some of the finest residences where the cost is in no way the determining factor.

Finish Adapted to Product

Whatever the surface requirements may be, the actual method of finishing used must be adapted to the individual product. Some pieces, for instance, are so shaped that they cannot be properly coated by dipping, and this single condition may make it advisable to switch to an entirely different form of finish. In selecting a finish for a given metal product, it is desirable first to determine the desired appearance. Any one of many methods may give a satisfactory appearance on an article adapted to its use, but when the quality of appearance has been set and the nature of the article is fixed, the selection of finish narrows down to a comparatively few types. Some products have parts impossible to reach with a spray gun or a brush, and still other parts may be a combination of surface peculiarities calling for two or more methods of applying a finish. In plating, it is often necessary to go to an entirely different metal in order to secure sufficient throw to reach recesses in the article. Spraying is the most common method of applying enamel, lacquer, or paint, and the technique of spraying has been so highly developed that barrels are now automatically spray-coated in two or more colors in a continuous process. At the plant of the Waltham Watch Co., clock and watch faces are put through an automatic continuous process of spray coating and drying. The emphasis in this field of finishing has brought with it a development of auxiliary equipment which tends to cut the unit cost to a comparatively low figure.

Appearance and cost are not the only considerations in selecting a metal finish. The utilitarian features are often paramount. A case in point is a metal display rack for storage batteries. Here the finish must resist the attack of battery acids which may occasionally be spilled on the rack.



A large manufacturer of dolls' eyes buys flat steel sheets lacquered and lithographed with hundreds of the eye designs in color. These he stamps and forms into the finished eye shell without surface injury

Refrigerators are another example. Here the changing temperature conditions, the extreme humidity, and the need for a finish impervious to food acids and food vapors determine the selection. In the case of condenser tubes, the appearance of the finish has no value from a decorative standpoint, but has a decided value when it comes to accepting or rejecting the finished article. That is, experts accept or reject condenser tubes to some extent from a visual examination or appearance. Recently, for instance, the American Brass Co. brought out a new tube produced by a new method of manufacture, extrusion. Here the better surface finish helped a lot in getting this product accepted for its real worth.

Plating

Plating as a manufacturing process is still in its infancy, and development in this field is perhaps as active as in any other at the present time. One engineer has said that the possibilities in the use of chromium plating for industrial machine parts hardly have been touched. The life of heavy and costly rolls in the paper industry has been increased as much as 30 times by chromium plating. In the textile industry, Schreiner rolls used for finishing cloth formerly had a life of about 200,000 yards. Now, when plated with a chromium alloy, they have shown a life of 8,000,000 yards. In the appearance field, new methods of plating are strongly competitive with lacquer and other finishes. One manufacturer has produced unusual color combinations by chrome plating sheet copper and then etching and lacquering it. This material is being used with success in the manufacture of a high-grade washing machine. In the bicycle industry, plating in two or more contrasting colors is being done successfully. The method here is to use metal masks to shield one part of a surface while another part is being plated. Nickel plate is now used for ferrules on paint brushes, and an alloy known as nickeloid is finding extensive use for the clip which seals the ends of toothpaste tubes.

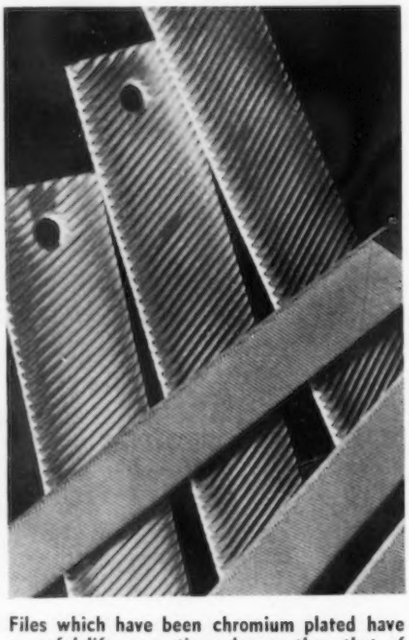
Lithographing and Specialty Finishes

Progress in lithographing on metal has been rapid during the past few years and it is now possible to put special designs of many colors on steel sheets and have the finish remain unmarred through subsequent forming operations. An example of this type of work is shown in an accompanying illustration. In this case a large manufacturer of dolls' eyes receives as raw material lithographed sheets containing a multitude of individual eye designs. These are stamped and formed into shapes approximating a complete sphere, with the lithographed design on the outer surface. Success in this unusual process has been dependent upon close cooperation between the manufacturer of lacquers and inks, the manufacturer of the steel sheets, and the designers of the forming dies. Heat is used at one or two places where the most severe movement of the metal occurs, but engineers feel that even this precaution will be unnecessary after some further research with lacquers and die processes. Lithographed sheets carrying special designs are used in the manufacture of toys, radio cabinets, andirons, electric fixture parts, and for faces of watches and clocks.

Specialty finishes are available in a great variety of color and design. Some of these are known as the crystalline, the stippled, the wrinkled, the veiled, and the spattered surfaces. The wrinkle finish consists merely of a varnish which of itself wrinkles up under the action of heat. Originally this particular tendency of certain varnishes was considered a defect, but someone seized upon the defect to create a new finish. Many of the highly individualized novelty patterns are actually less expensive to produce than a plain smooth one in a solid color.

Veiling

One of the most ingenious of the modern specialty finishes is that produced by the Ault and Wiborg Varnish Works known as a veiling lacquer. Here the spray nozzle has tubes leading from two or more different kinds of lacquer reservoirs and by regulating the various air pressures an almost unlimited variety of finish and pattern is secured. The Continental Can Co. has devised several interesting processes in the finishing of tobacco cans. In one case a can is finished in five colors with three operations. The first consists of a coat of white enamel and this is followed by two operations each producing two-color lithographic patterns. These operations are followed by a continuous automatic drying process and a final transparent varnish to protect the surface.



Files which have been chromium plated have a useful life many times longer than that of the unplated product

A novelty made of metal, but at the same time a practical display item, is an imitation open candy box. Here the finish for the individual candies is accurately reproduced on thin steel sheets in imitation of chocolate and other coatings. After these sheets have been formed into exact shape in the subsequent die operations, it is almost impossible to tell the finished product from an actual piece of candy.

A special soft lacquer is available, which melts at a low temperature and which therefore can be used as a glue in process. An example is a metal

SELECTING THE BEST METAL FINISH

In many metal fabricating plants the processes required to give desired appearance and surface characteristics represent fully a third of the plant's total activity, and for the whole metal working industry the value represented by finishing these by polishing, plating, enameling, and similar processes is probably close to 10 per cent of the total value of the manufactured products. In the case of polishing, for instance, the value added to products each year by this method is estimated by one authority to be about $450,000,000. An example of high proportion of value represented by finishing is furnished by the cutlery industry where the polishing and plating processes usually exceed 50 per cent of the total production cost. The total annual value of products in this industry is given by the Government as about $165,000,000.

Yet, with all this, the average manufacturer knows less about finishing than about most any other operation in his production sequence. The selection of finish for his particular product is often left to the whim of the plant superintendent or the purchasing agent, and the importance of one finish as against another, from the point of view of cost of manufacture and of increased sales appeal, is too often ignored. One manufacturer, commenting on this, tells how sales have been multiplied in the case of typewriters by bringing out a line in different colors. Another manufacturer explains how the development of new finishes has greatly widened the market for steel products. A case in point is the wood grain finish which makes it possible to use steel sheets for wainscoting in the finest type of residences.

Today the manufacturer who does not take advantage of the striking development in characteristics of metal finishes may be losing money through an unusually high cost of production. Enameled and lithographed sheets supplied flat to the fabricator may be stamped and deeply formed without injury to the finish, so that the product of the last press becomes a decorative article ready for the shipping department.

In an attempt to give the progressive manufacturer a better knowledge of available metal finishes and of the technique involved in their production, a series of articles is being presented in The Iron Age. The series will include among other subjects, cleaning, pickling, plating, lacquering, and polishing.

bottle cap having a thin cork disk on the inside. In the manufacturing sequence these caps with special lacquer on the inside are carried upside down on a conveyor past a point where they receive the cork disks and on to a heating zone which melts the lacquer and causes permanent adherence of the cork to the metal.

Experience indicates that men take better care of tools when they have an attractive finish. These tools were given a dull luster chromium plate developed by United Chromium, Inc.

A special method of applying finish has been developed for the familiar collapsible tin tube. These tubes are made by the extrusion process. A small lozenge of pure tin about the size of a nickel is placed in the extrusion machine which forms the thread and shoulder and then extrudes the sides to form the tube. The tube is then placed on a mandrel and is rolled over a plate to pick up the finish, a reversal of the usual method of applying finish where the design is transferred by a roll to a flat sheet.

Rubber covering on steel has proved a practical means of resisting the action of chemicals. This covering also is used for its decorative effect. Usually the rubber is applied before vulcanization. Recently a process called the anode process has been developed for coating steel with a thin latex film.

Cost of Lacquering

The cost of finishing a metal product in relation to the total production cost varies greatly, depending upon the nature of the product being finished and the nature of the finish. In the case of cutlery and reflectors, the cost of finish is obviously high. In the case of wrenches the finishing must represent a comparatively small percentage of the total cost. Some decorative metal signs, where the color combination and finish texture give the article its chief value, may have a finishing cost of two or three times the cost of the metal stamping itself. One manufacturer estimates that throughout the metal working industry the cost of finishing products will average close to 3 per cent of the total cost of the product. In the case of lacquering, some more definite figures of cost and importance in the industry are obtainable. In one typical case a modern cash register costing $150.00 and weighing about 50 lb. requires for its finish 1 pt. of lacquer at a cost of 50c. and the labor and overhead cost runs to about $1.00. This means that for work of this particular type it costs $1.50 for finishing a $150.00 item, which means 1 per cent for the cost of the finish. From another angle in this particular case, the finish cost is 3c. a lb. From this example it would be possible to make certain generalities, and a rough estimate of the total value represented by the finishing of certain types of product could be made. The value of a finish naturally bears no direct relation to its cost. In the case of a portable typewriter, sales were sluggish and the sales manager hit upon the happy idea of using different colored coatings to replace the universal black. Sales immediately increased and have continued entirely out of proportion to any increase in cost.

An average automobile body takes a gallon of lacquer, and in one rather typical example, in round numbers, this lacquer cost $3.00, the direct labor of application totaled $3.00, and the overhead $4.00, which means that the finish on an average automobile body represents approximately $10.00, or, roughly, $30,000,000 for the United States automobile industry. The cost of producing a finish, of course, usually is one of the most important considerations in making the selection in any given case, but sometimes the increase in sales appeal is such as to make the comparatively slight cost of finishing a minor item.

Two trends are apparent in recent years. The demand for more attractive finish, through its stimulation of research work, has caused the development of a great number of surprising finishes for metal, and on the other hand the development of new finishes has stimulated the interest in appearance possibilities on the part of the manufacturer of metal products. The familiar story about Mr. Kettering of General Motors illustrates one phase of the excessive demand made of a metal finish.

The National Cash Register Co. was one of the first to use a wood grain finish on a standard metal product. It proved so popular that now it is almost a universal finish with this company

A Typical Kettering Story

Some years ago when it took about 48 hours for the automobile body enamels to dry, Mr. Kettering called

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The Welding Rod for Arc Welding

WELDING rod developments were discussed at some length by E. A. Hurme, engineer, Clark Controller Co., Cleveland, in a paper on the "Growth of the Electric Arc Welding Industry," read before the recent meeting in Pittsburgh of the Association of Iron and Steel Electrical Engineers. So many fantastic claims have been made for arc welding, said he, that many individuals are today skeptical, if not openly scornful, about its supposed advantages, and he was led to pursue a critical examination of the subject with the paper mentioned as a result. This paper, devoted largely to welding rods, was in part as follows:

In the hands of a good operator excellent welds can be made with bare rods. One of the big disadvantages of the use of bare rods, however, is in the lack of surface uniformity which affects the arc characteristics and in turn the weldability qualities of the welding rod. It is for these reasons that a rapid increase in the use of welding rods with carefully controlled coatings, for all classes of welding, is taking place, thus providing greater uniformity in both arc characteristics and improved quality of the weld metal produced.

The significance of this change is shown by the fact that, while in 1927 approximately 85 per cent of the electric arc welding was done with bare rods, in 1932 bare welding rods constituted considerably less than 25 per cent of the total consumption of electric arc welding rods.

Bare welding rods have had and still have their place in the development of industrial welding and for many applications they produce satisfactory results. Welds made with bare rods may exceed the parent metal in ultimate strength and be sufficiently dense to meet some pressure requirements. Such welds, however, are greatly inferior to the parent metal in ductility, resistance to corrosion, fatigue and impact stresses and generally show considerable porosity. Welds made with bare rods may have an elastic limit greatly exceeding the parent metal. This fact, in combination with a satisfactory tensile strength, enables their successful use in fabricating many light, flexible structures. In such cases, the parent metal having a lower elastic limit than the weld, will distort without causing weld failure.

In the welding of heavy rigid members a different condition is introduced; namely, higher rigidity due to a greater section modulus. In such heavy structures the parent metal resists distortion and the weld metal must be sufficiently ductile to absorb the stresses set up by its own contraction in cooling down after deposition. Because of lack of ductility, bare rods have not been successfully applied to the welding of heavy structures.

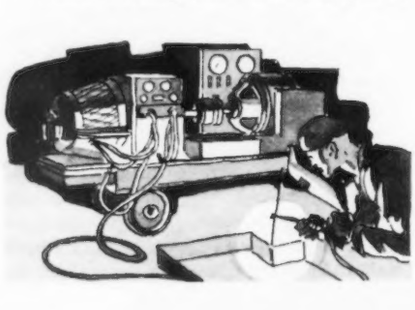
Welding with Bare Rods

Welds made with bare low-carbon steel rods have rather low ductility due to the absorption of oxides and nitrides from the surrounding air, which are exceedingly active chemically at the melting temperature of the welding rod. The extremely high temperature of the arc (estimated at 3700 deg. C.) is a contributing factor to this condition of contamination, since the absorption of oxygen and nitrogen increases rapidly with the temperature. The transfer of metal from the rod to the work is thought to take place in the form of minute pellets and in this divided form the conditions are especially conducive to contamination.

The combination of extremely high temperature and relatively large surface area of the metal which passes through the arc, with bare welding rods, readily permits chemical reactions between the oxygen and nitrogen of the atmosphere and the elements of the molten metal. Oxidation and partial elimination of the carbon and manganese of the weld metal occurs, and, at the same time iron and possibly manganese nitrides are formed and absorbed in the molten metal. The amount of these inclusions depends upon the current used and the length of the arc.

The length of the arc is therefore an important factor in governing the quality of the deposit made with the bare mild steel welding rods. The skillful operator using bare welding rods generally selects a small size, uses low amperage and holds a short arc. For quality work with bare rods, the operator is thereby limited to low production rates.

When welding with bare rods, iron and manganese oxides are absorbed. Also many of the gases formed are unable to free themselves during the rapid freezing of the molten weld metal. It is the presence of these elements in the weld metal, made with bare rods, which impairs its strength, causes low ductility and low resistance to corrosion, as well as low impact strength.



Comparisons of bare rod deposited weld metal analysis with the analyses of the original bare rod show that the carbon content has been reduced to a negligible amount, that the manganese content has been materially decreased and that a great increase in absorption of oxygen and nitrogen has taken place.

Surface Conditions of Welding Rods

It has also been established that surface conditions of the welding rods have a greater effect on the quality of the welded joint than any other single factor.

In the bare wire electrodes used for electric arc welding the residue of lime, iron oxide and other impurities left on the surface during the wire drawing process is a decided advantage in increasing the arc stability and as these impurities float off the molten weld metal, they do not affect the quality. In fact, in all bare wire electrodes, the arc characteristics depend very largely on the hit-or-miss form of coating placed on the surface during the drawing operations.

On the basis of these and other findings, the arc welding industry has made tremendous progress in that it has developed a variety of specialized welding rods, which make possible the fabrication and construction of structures, machines and commodities from many grades of steels and alloys, thus opening new fields of application.

The surface coating materials are usually non-metallic, although they may contain metallic elements and affect the characteristics of the electric arc in one or more of the following ways:

Stabilizing Coatings

Stabilizing coatings tend to stabilize the electric arc by supplying materials readily volatile below arc temperatures and thus, to a limited extent, they produce a neutral or slightly reducing atmosphere surrounding the arc stream, thus reducing the oxidation of the incandescent metal and thereby improving the quality of the deposited weld metal. This class of coatings, however, should not be con-

fused with the so-called shielded arc types described later.

Stabilizing coatings may also be applied to increase the depth of penetration for welding heavy parts or to reduce it for light gage work.

Deoxidizing or Purifying Coatings

Deoxidizing or purifying coatings deoxidize and may also purify the weld metal to a greater or lesser degree by reducing the oxides and nitrides in the weld. These coatings are generally metallic substances possessing greater affinity for oxygen and nitrogen than iron and, for that reason, readily unite with whatever oxygen is carried over into the weld metal to form a fusible slag which floats to the surface of the weld metal where it can be easily removed.

Speed Coatings

The melting rate of a base rod may be increased two or three times without any harmful effects on the quality of the weld metal by adding special stabilizing materials to the coating so that the welding rod may operate with higher amperage and longer arc. With the increased melting rate, the welding rod carries the current for a shorter period of time and thus makes possible the use of higher currents without overheating the rod.

These speed coatings also cause the metal to pass from the welding rod to the work in fine particles so that the heat is always working on unmelted steel in the welding rod.

Alloying Coatings

Due to the fact that weld metal is deposited in the form of a casting, its physical properties cannot be, to any appreciable extent, improved by mechanical working, such as rolling, forging, etc. To take the place of this mechanical working, suitable elements or alloys may be added in the coating to improve the physical characteristics of the deposited weld metal. These elements melt and unite with the base metal as they pass through the arc and directly govern the physical properties of the weld metal.

Several or even all of these various classes of coatings may be combined to produce a single grade of welding rod. In fact, by proper combination it is possible to give the user virtually any quality of deposited metal which the specific application requires.

The surface coatings thus far described tend primarily to protect the weld metal from contact with the air during the deposition period.

Shielded Arc Welding

The latest and most far-reaching improvement in welding—the shielded arc electrode—not only protects the weld metal from contact with the air during the transfer period and does it infinitely better but it accomplishes still more.

Shielded arc coatings are in reality extensions to the stabilized types enabling the arc to be surrounded by a heavy envelope of reducing gases which not only protect the steel passing through the arc from the action of the air, but also act as purifying agents and in this way reduce the oxides and nitrides in the weld metal to an extremely low value.

E. A. HURME, engineer, Clark Controller Co., Cleveland, addressed the Association of Iron and Steel Electrical Engineers on the growth of electric arc welding.

In addition to higher tensile strength and ductility as well as the great increase in speed of welding, welds made with the shielded arc process have high resistance to corrosion. This is due to the density of the weld metal and the elimination of iron oxides from it.

Shielded arc welding electrodes have three large fields of application; namely:

1. The welding of rigid structures of all kinds where the high strength and ductility of weld metal is required, such as pressure vessels, boilers, machine bases, frames and pipe lines.

2. For high-speed applications where reduction in production costs are important, such as low-pressure storage tanks, boilers and heavy metal cabinets and containers, as well as many machinery parts where quantity production is involved.

3. For work where welds are subject to corrosive action, such as refrigeration equipment and for parts used in outdoor and underground service.

Alloy Steel Welding Rods

The welding rods discussed thus far are primarily for use with ordinary mild steels; but fully as great progress has been made in the field of welding alloy steels even though this field has presented many serious problems.

For instance, if a weld is made with a welding rod composed of a given alloy steel, the deposited metal, oftener than not, is found to have changed considerably in composition by its passage through the arc. Moreover, many alloys, when used as welding rod, have poor flowing characteristics, or in some other way seriously affect the operation of the arc so that their use is impractical.

And even if these difficulties did not exist, it would be impractical for steel mills to produce many of the alloy steel welding rods required for special applications.

But, since the electric arc is a miniature electric furnace, it provides an excellent method for introducing desired alloys in the deposited weld metal by incorporating them in the welding rod coatings. Thus the fundamental principles applied in the manufacture of electric furnace steels are similarly employed in the processes of manufacturing many coated alloy steel welding rods.

The steel maker starts with a known base and adds alloying ingredients or deoxidizers in proper proportions to produce a steel of a given composition. By varying these charges different steels are produced.

Likewise, in the manufacture of some makes of coated alloy steel welding rods, a known base metal having good arc characteristics is selected and to this base is applied, in the form of a coating, alloying ingredients or deoxidizers in predetermined quantities. As stated before, the arc is a miniature furnace in which the alloying ingredients unite with the base metal. The parent metal is the mold in which the alloy is directly cast. The weld metal has definite physical characteristics controlled through the coating and the welding rod manufacturer varies the coating according to the weld metal requirements.

With this elemental steel making process at his command the welding rod manufacturer is able to match the composition of the material which is to be welded. In this way the working qualities of the welding rod and the entire characteristics of the weld metal may be changed at will by changing the character of the materials on the welding rod surface.

An interesting illustration which shows how the coating material may completely change the deposited weld metal is the case of high-manganese welding rods made from low-carbon steel base rod which is given uniform coating of alloy ingredients carefully controlled as to weight. To obtain maximum wearing qualities, manganese steel should contain from 10 to 15 per cent manganese and about 1.25 per cent carbon. A relatively slight drop below this range in the manganese content results in a considerable reduction in the wearing qualities of the metal.

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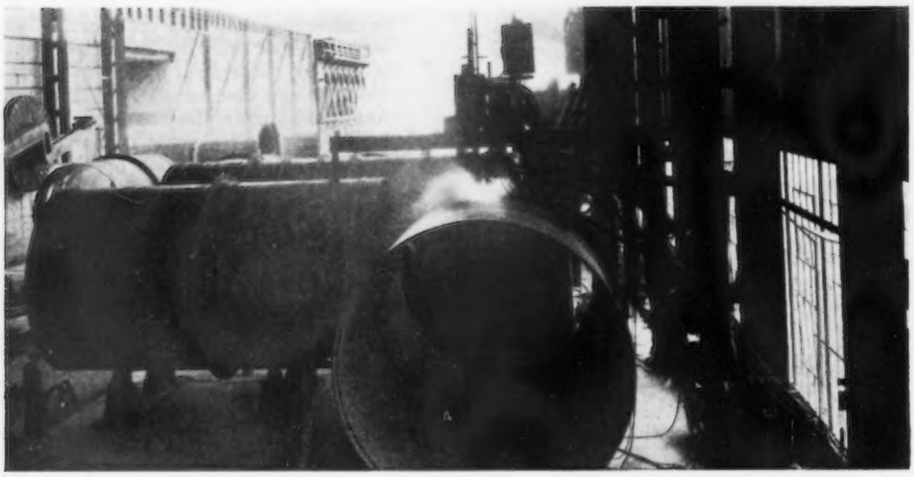
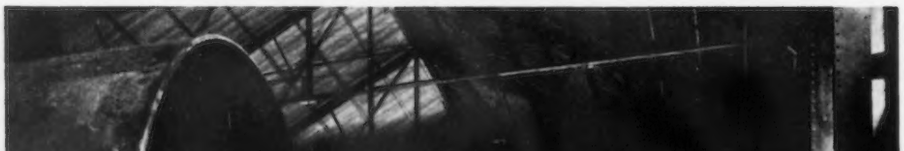




Giant Welded Pen
At Boulder Ca

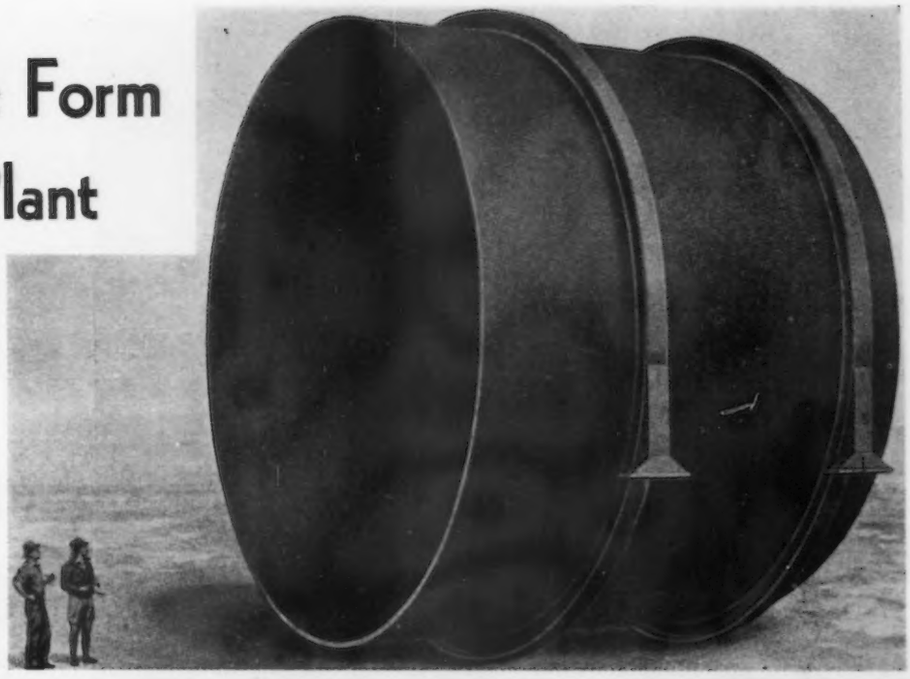
AFTER fabricating over a mile of 8½ and 13-ft. fusion-welded steel-plate pipe for hydraulic-power and normal-flow-control tunnels to be installed at Boulder Dam, Babcock & Wilcox Co. recently commenced construction of the giant 25 and 30-ft. penstocks. Illinois Steel Co. is supplying the 1⅛ to 2¾-in. steel plates, measuring 32 ft. by 12 ft.; these are the largest that can be made and shipped to the field plant. Three of the plates, joined together, will form a pipe section 30-ft. in diameter and about 12-ft. long. Two such sections will comprise an erection-section, and each will weigh approximately 150 tons.

Upon arrival at the shop, the plates and stiffening rings are flame cut to pattern as shown in the upper left illustration. The edges are suitably machined on a 40-ft. special planer, and the plate is then rolled into cylindrical or conical form by a vertical bending roll as described in THE IRON AGE, issues of July 20 and Aug. 10.

After conventionally U-grooved and formed to proper shape, the abutting longitudinal seam is fushion-welded, using flux coated electrodes and a Babcock & Wilcox Co. automatic 36,000-watt A.C. machine as shown in the center left view. Upon completion of the outside weld, the inside is chipped flush and local impurities chipped out, following which a light inside weld is applied. The machine, including the rack to carry the electrodes along the inside seam, is shown in the lower left. When two sections are completed they are welded together, and during the process alinement is maintained and distortion prevented by means of an internal hydraulic spider.

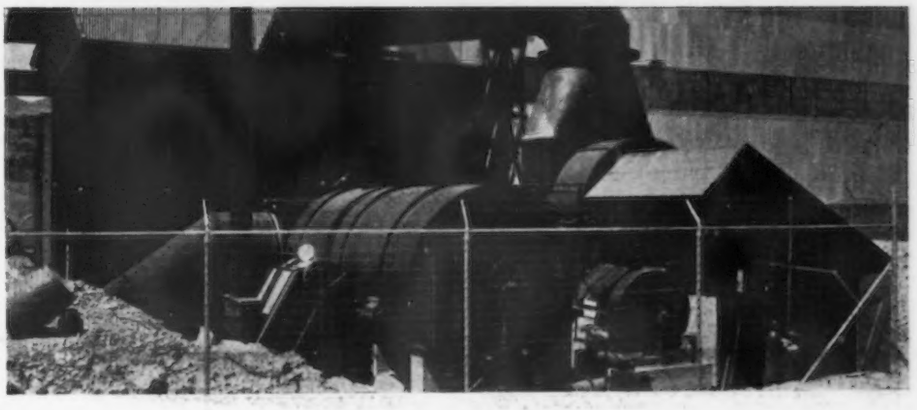
The comparative size of a man and a section of the 30-ft. pipe is strikingly illustrated by the drawing at the upper right. In usage, the pipe will withstand sizable uniform radial

Penstocks Take Form Canyon Field Plant



pressure, but, despite the 2¾-in. plate thickness, a section, unless supported, is inclined to distort or collapse under its own weight before installation. To avoid this, reinforcing rings and butt straps are formed and welded, then heated uniformly as shown in the right upper center view. The rings are then fitted on the pipe and, after shrinking, are welded to the pipe. These projecting, supporting rings are clearly discernible in the upper right and center left views.

Upon completion of welding, every inch is explored with a powerful, portable X-ray machine shown in the right bottom center view. The specially designed 300,000-volt machine will make over 400,000 linear feet of exposures in order to examine all the seams. If X-ray testing shows complete soundness, the sections are stress relieved by heating to 1200 deg. F., and holding at that point for an hour for each inch of thickness. Cooling is moderately slow, and averages about three hours. The furnace is the largest of its kind, 36 by 41 by 32 ft., and is of the car-bottom type with front wall integral with the car. The oil-fired combustion chamber is separate from the furnace and is shown in the bottom right illustration. The heated gas chamber can be seen as well as portions of the conduit which transfers the hot gas to and from the furnace. Fuel consumption averages 800 gal. for each section, and the circulating hot gas is reversed every 5 min. to guarantee temperature uniformity in the furnace. Automatic control reduces temperature variance for this cycle to within 20 deg. F. Weld test specimens are then taken from each section and subjected to tension, bending, hydrostatic and specific gravity tests. When passed, 100 per cent perfect, the pipe, 15,000 ft. in all, will transfer the waters of Black Canyon to and from the 1,800,000 hp. turbines.



The Movies Visit a Steel Company

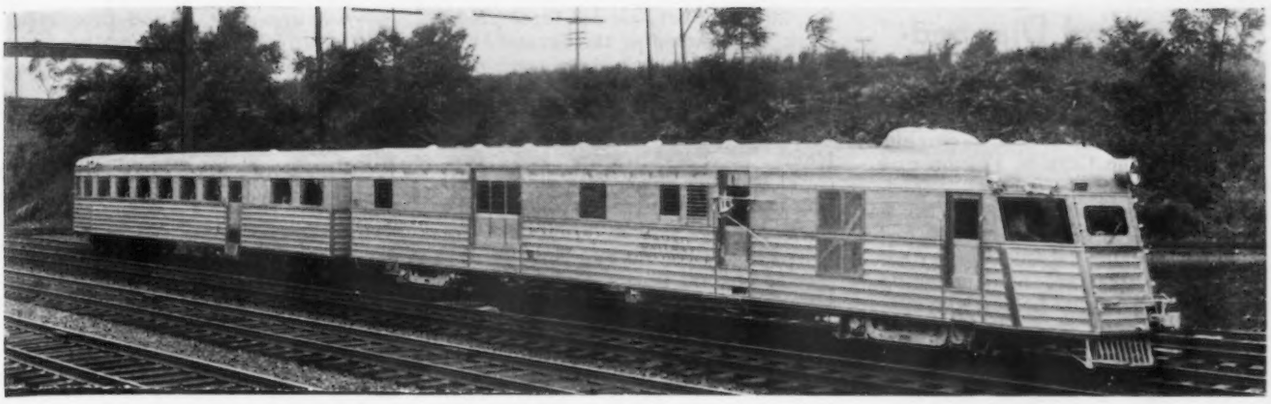
MOTION pictures in their search for interesting and thrilling backgrounds have come to the steel industry in a feature picture called "Master of Men" made by Columbia Pictures.

Unlike many features which have employed the highly developed art of counterfeiting scenery and setting, this picture was made in a steel mill. The sequences depicting steel operations were photographed at the Pacific Coast Steel Corpn. in Los Angeles. This company, while not large, covers twenty-five acres and employs between five hundred and one thousand men. It operates on a twenty-four-hour schedule. Gas and oil are used as fuel. The operations are sufficiently extensive to provide motion picture fans with a fairly adequate account of the difficulties of steel mill operations.

The Pacific Coast Steel Corpn. was selected because of its nearness to the motion picture center. It was a comparatively easy task to move the photographic and sound equipment into the mill.

The leading role in the picture is taken by Jack Holt. Many of the minor parts, particularly the roles which demanded that the players engage in making steel, were filled by steel workers. The manufacture of steel forms the background of a romantic story and in this way the picture will have a wider appeal than a film devoted only to explaining the conversion of iron into steel.

Actors discovered that a steel mill is not as comfortable a stage as a studio—nor as safe. Fay Wray, who has the leading feminine role, ruined an expensive gown, but it was all in the day's work and for the good of the picture.



Budd Completes First "New Deal" Gasoline Railroad Train

BRISTLING with ultra modern ideas in speed, comfort, safety and economy in rail travel, the E. G. Budd Mfg. Co., of Philadelphia, has completed for the Texas & Pacific Railroad, a two-car stainless steel "shot-welded" air-conditioned, rubber tired, gasoline driven train.

It will provide 50 per cent more speed than the two-car steam train it is replacing, with 1/5th of the horsepower and 1/6th of the weight at ½ of the operating cost.

Making a maximum of 75 miles an hour, with luxurious seating and baggage accommodations for 76 passengers, separate compartments and toilet facilities for white and colored travelers and the first standard railway postal compartment translated into stainless steel ever authorized by the U. S. Post Office Department.

The new train is an outgrowth of the light-weight one and two car stainless steel trains recently built by Budd and now in successful use by the Reading Co. and Pennsylvania Railroad. It contains many features which will appear in the sensational 3-car streamlined train of stainless steel now being built in the Budd plant for the C. B. & Q. Railroad.

The complete train weighs only some 100,000 lb. against a weight of approximately 600,000 lb. for a steam driven train and locomotive of similar capacity. Both cars combined weigh only a little more than one-half the 80 tons of a standard steel sleeping car.

The two cars are very different in construction and purpose. The forward or operating car, carrying no passengers, contains the two 240 h.p. American-La France gasoline engines and all propulsive machinery for the entire train in addition to the electrical apparatus, the air conditioning equipment, the 15-foot railway postal compartment and a large baggage room. The only wood used in the train is in the replaceable maple floor boards and some of the postal equipment in this car which rides on two 4-wheeled steel tired trucks each carrying two 300-volt Westinghouse motors.

There will be no battles with sticking windows and no flying cinders in the second car. The windows are sealed shut and clean air, constantly circulated from ceiling ducts is refrigerated in summer and heated in winter.

This car rides on sixteen pneumatic tires divided between two 8-wheeled trucks equipped with Timken roller bearings and is completely silent, there being no moving apparatus of any kind. It is further insulated from vibration by a flexible coupler of Budd design, between the cars.

Safety features of the train comprise a quick acting double braking system, complete automatic lighting and signal equipment, non-shatterable glass, automatic power and electrical shut-off to avoid fire hazard and automatic engine stops when oil pressure fails.

In operating car a number of well known companies have cooperated in producing equipment never before seen in the railroad world. The car weighs, complete, 80,000 lb. and is mounted on two 4-wheel steel tired trucks of light weight cast steel built by the Baldwin-General Steel Casting Co., with complete equipment of Timken roller bearings. Each of the 12-cylinder 240 h.p. American-La France gasoline engines is direct connected to two main Westinghouse 600-volt generators and two auxiliary 50-volt generators. Each of the larger units drives two 300-volt electric motors for train power. The auxiliary generators drive the air-conditioning compressor, charge the battery and carry the auxiliary load including the lights.

The air-conditioning apparatus, all of which is located in the forward car, is of special light-weight design created by Westinghouse-Sturtevant. Refrigerated or heated air is conducted to the rear car through flexible ducts and, by thermostatic control, is kept at any desired temperature. In the forward car also is an oil fired heating boiler to provide heat in winter for both cars.

A very unusual note in this newest of railroad trains is the truck frames on the two 8-wheeled rubber tired trucks on the rear car. These frames are of stainless steel, "shotwelded" by the process originated by Budd in its building of several million all-steel automobile bodies. These trucks, also, are on Timken roller bearings.

The lengths to which the engineers have gone in the elimination of weight and the increase of strength in various features of this train, are illustrated by the tanks, all of which are of stainless steel. The air reservoirs are of 3,000 cu. in. capacity, weigh only 17 lb. against a normal weight of 68 lb. Six stainless steel fuel tanks holding a total of 500 gal. of gasoline, or, to be exact, 83 gal. per tank, weigh 45 lb. each. The average steel tank of this capacity weighs around 300 lb. None of the tanks on the new Budd train will ever need hammer testing because, being of stainless steel, they cannot rust.

In the creation of this latest step in the railway transportation of the future, J. L. Lancaster, president of the Texas & Pacific Railroad and A. P. Prendergast, the T. & P.'s superintendent of motive power, have had a large share.

Sharpens and Diamond-Finishes Carbide Tools

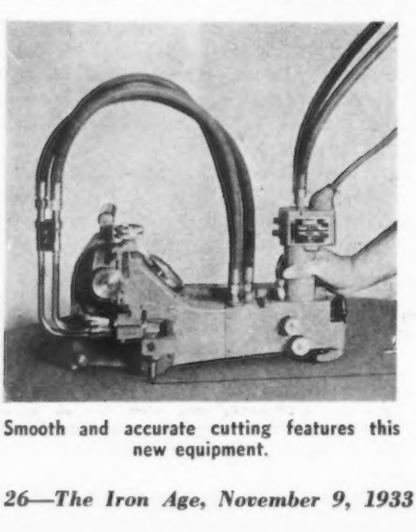
FOR sharpening and diamond-finishing tungsten and tantalum carbide-tipped tools the Carbide Engineering Corpn., 356 East Congress Street, Detroit, has placed on the market a new combination diamond cutting and grinding machine. Adjustable grinding tables, universal angle-grinding fixture, and a special holder with diamond for properly truing the grinding wheel are provided. Clearance angles up to 25 deg. are obtainable.

The diamond-impregnated plate is for producing a fine cutting edge.

The grinding wheel is of ring type, is 8 in. in diameter, and is mounted on a steel plate so that abrasive can be completely used. The diamond cutting plate, also 8 in. in diameter, is for use in producing a fine cutting edge. It is made of imported material, and impregnated with diamond powder. It is said to be given the same test for cutting ability that diamond cutters give their wheels before they are approved. Tools used for making light cuts can be regularly resharpened on this plate without previous grinding. Bench, as well as pedestal type machines can be furnished.

Portable Oxy-Acetylene Cutting Machine

A PORTABLE cutting machine that weighs only 43 lb. has been announced by the Linde Air Products Co., 30 East Forty-second Street, New York. Designated as the Secator, this machine is emphasized as combining the portability of a blowpipe with the accuracy and finish of a cutting machine. It is offered for use in steel plants, steel fabricating and other metal working shops requiring a cutting machine that can be taken to the work.

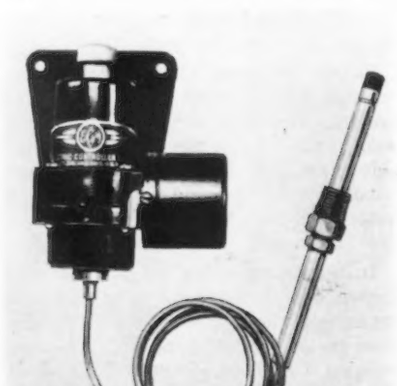


Smooth and accurate cutting features this new equipment.

Essentially the Secator consists of a special Oxweld type C-14-H blowpipe mounted on an electrically-driven air-cooled, dust-proof chassis. It is equipped with a direct drive and runs either on a 1½-in. angle - iron track, furnished with it, or on any relatively smooth plate. When operated on the track, straight-line cutting is accomplished automatically. For cutting simple shapes it can be guided with a handgrip. For automatic circle-cutting, a center and a radius rod are furnished. To facilitate control, the oxygen and acetylene valves are on the chassis rather than on the blowpipe. The blowpipe can be adjusted vertically and horizontally and also to cut bevels up to 45 deg. Its cutting range is that of the C-14 blowpipe, and the cuts are said to be so clean and smooth that for many purposes machining is unnecessary.

Bearing Thermostat for Machine Protection

"FOR protecting motor-driven and other types of rotating machinery from breakdowns due to overheated bearings, the Electric Controller & Mfg. Co., Cleveland, is offering the bearing thermostat illustrated. This thermostat is suited for use with motor-driven fans, conveyor systems, refrigerating machines, compressors, and the like.



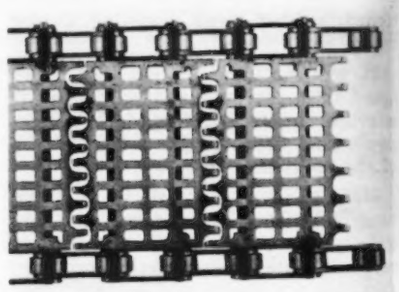
The bearing thermostat is set to operate at 212 deg. F.

Compact and of simple design, the thermostat consists of a sealed metallic bulb, containing a volatile liquid which is connected, directly or through flexible copper tubing, to a one-piece seamless metal bellows. The electrical contacts are of silver and are of double-break, quick-make and quick-break construction. A rise in temperature of the bearing of a rotating machine causes the volatile liquid to expand and generate pressure in the bulb. This pressure, in turn, is transmitted to the bellows, causing the contacts to open and shut down the machine.

The thermostat is arranged to operate at 100 deg. C., but can be adjusted 15 per cent above or below this value. It may be used with the bulb or relay in the upright, horizontal or inverted position.

Chain Conveyor for Handling Hot Bottles

THE Link-Belt Co., Indianapolis, has brought out a new line of chain conveyors for handling hot bottles, as from molding machines to lehrs or normalizing furnaces. In the development of these chains, it was recognized that a certain amount of checking occurs when a hot bottle is transferred to a cold conveyor chain. Consequently, the new chains employ a copper tray of grating type connected to, and supported on or from the inner sides of two strands of finished steel roller chains. As copper is a better conductor of heat there should be considerably less, or practically no checking, as compared with conveyor chain made either of steel or malleable iron.



A grating-type copper tray is connected to steel roller chains.

The standard tray is 4¼ in. wide but trays of other widths can be furnished. A perforated steel plate tray for the bottles can also be furnished, where desired.

Ohio Ferro-Alloys Corpn. has moved its Chicago office from 545 North La Salle Street to 111 West Washington Street. L. S. Johnson is Chicago representative.

Develops New Precision Tool-Room Surface Grinder

THE Monarch Machine Tool Co., Sidney, Ohio, has announced a hand-feed precision tool-room surface grinding machine, the No. 2, having among other features an Ex-Cell-O inbuilt direct motor-driven spindle. Both spindle and motor are inclosed

in a common body, forming a compact and balanced one-piece unit. The spindle is equipped with two Ex-Cell-O precision ball bearings especially developed for this type of service.

Automatic force feed lubrication of all bearings except spindle bearings, which require special oil, is a feature. The oil reservoir is in the machine base, where it may be easily filled. The high pressure pump supplies oil automatically through metering pins to all surfaces requiring lubrication. The pump is operated from a cam on the cross traverse handwheel. All bearing surfaces are completely protected from dust and dirt.

All castings except those forming the cabinet base are normalized to eliminate the possibility of distortion in use. A large area of lubricated bearing surface, 75 sq. in.; is provided between the spindle carrier and columns to assure prolonged accuracy.

Instead of the usual rack and pinion for table traverse, a roller chain and sprocket is used. It is stated that in addition to smooth table travel, the chain drive eliminates gear tooth marks on the work and prevents backlash. The sprocket is mounted on a splined shaft which is geared to the traverse handwheel shaft, one turn of the traverse handwheel, which is 7 in. in diameter, gives 2 in. of table travel. A convenient adjustment is provided to eliminate all lost motion, and it is stated that the chain and sprocket construction is unique in that there are no parts to wear.

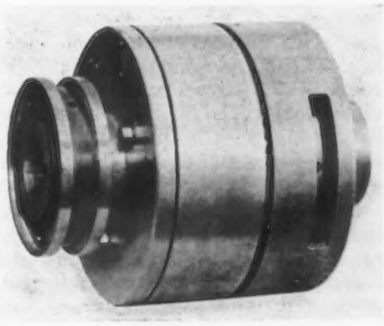
Both traverse and cross-feed handwheel shafts are mounted in antifriction bearings. An adjustable nut is provided on the spindle elevating screw to compensate for wear and eliminate backlash. The spindle elevating handwheel is graduated in 0.0005 in.

An Ex-Cell-O high-speed ball-bearing spindle attachment that fits over the front part of the spindle housing can be furnished. The bracket that holds this high-speed spindle clamps in any radial position on the main spindle. Speeds up to 18,000 r.p.m. can be obtained.

Specifications of the No. 2 surface grinder include: Length of table travel, 18 in.; cross saddle travel, 6¾ in.; working surface of table, 18 in. x 6 in.; standard wheel size, 7 in. x ½ in.; vertical movement of wheel spindle, 9 in.; maximum distance from standard wheel to table and to magnetic chuck, 9 in. and 6 in., respectively. The machine occupies floor space of 41 x 66 in., and is 72 in. high. Its weight is 1400 lb., net.

Small Magnetic Clutch for Wet and Dry Operation

THE Magnetic Mfg. Co., Milwaukee, has brought out a new line of multiple-disk magnetic clutches, 6 in. in diameter and larger, for both wet and dry operation. This line, the style C, supplements the company's larger style B line, and has all the features of the larger series. The new series clutch is believed by the makers to be the first magnetic clutch

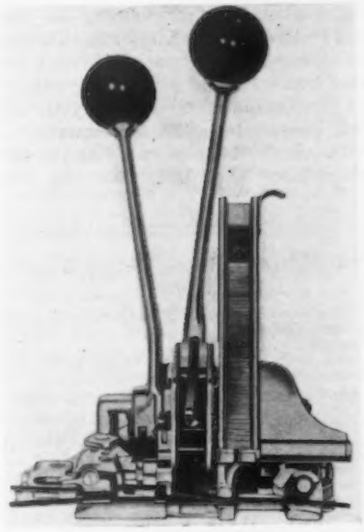


offered the trade for operating in oil, water or similar liquids.

Although comparatively small in diameter the new clutches have high torque capacity and ample friction area. Cool operation and simple one-point adjustment to compensate for lining wear are other features. The coils and other electrical parts are amply insulated and held securely in position. Complete impregnation against moisture is provided. Collector rings, brush-holders and brushes are supplied as part of the clutch, which is built with from two to eight disks.

Box Strapper Has Automatic Seal Feed

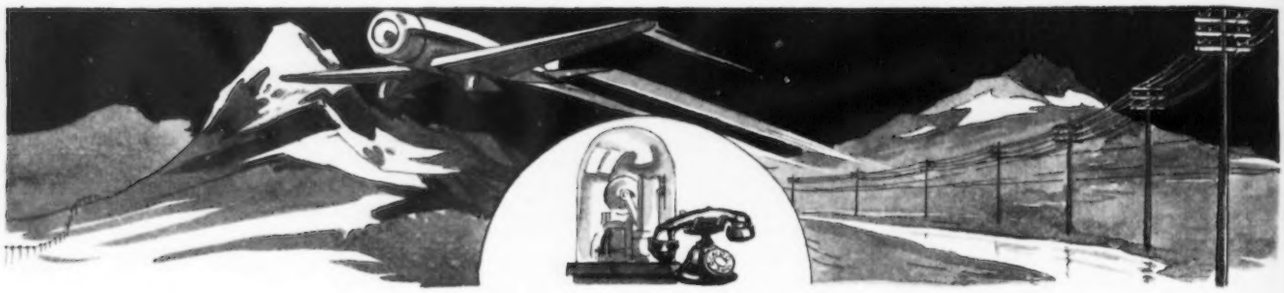
GREATLY increased speed in box strapping is claimed for the new strapping tool with automatic seal feed, brought out by the Acme Steel



Co., 2840 Archer Avenue, Chicago. This tool, designated as the Steelstrapper, for reinforcing of wood and fiber boxes, tensions the strap, applies the seal, seals the joint and cuts the strap from the coil.

Operations are controlled from two ball-tipped levers. The left-hand lever tensions the strap, and the right-hand lever does the sealing, at one stroke. The automatic seal feed device incorporates a clip that contains 100 seals. It is pointed out that this new feature permits uninterrupted operation, with reduction in strapping time and cost. The tool is ruggedly constructed throughout.

The ninth annual conference on welding, to be held at Lafayette, Ind., Dec. 7 and 8, under the direction of the university's engineering extension department and the department of practical mechanics, will include exhibits and demonstrations, as well as addresses on various welding processes.



THE NEWS OF THIS WEEK

Rise in British and Continental Steel Prices

LONDON, ENGLAND, Nov. 8 (*By Cable*).—British steel and iron are responding to the gradual and sustained improvement in business in the United Kingdom. Demand for domestic pig iron is active, Cleveland makers being practically sold out for the remainder of the year and well booked into the first quarter of 1934. A shortage of fuel has prevented raising the daily melting rate. Hematite makers are disinclined to book orders even at the recently increased rate of 62s. 6d. delivered to local users.

Semi-finished steel is active, open-hearth billets having been raised this week 2s. 6d. Increase in shipbuilding activity has stimulated steel demand and Argentina, India and China are buying merchant steel more actively. Tin plates are quiet and prices are easier.

The International Steel Cartel has raised Continental finished steel prices 2s.6d. for most markets but excluding the United Kingdom.

Forges de Clabecq has seceded from the Belgian Cartel and has formed its own sales agency which has been entitled Commerciale de Clabecq.

Poland and Bulgaria are undertaking the barter of steel rails for fruit, Poland having increased its import quotas.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9		
Billets, open-hrth.	£5 7s. 6d.	to	£5 12s. 6d.
Black sheets, Japanese specifications	£11		
Tin plate, per base box	16s. 9d.	to	17s. 3d.
Steel bars, open-hearth	£7 17½s.	to	£8 7½s.
Beams, open-hrth.	£7 7½s.	to	£7 17½s.
Channels, open-hearth	£7 12½s.	to	£8 2½s.
Angles, open-hearth	£7 7½s.	to	£7 17½s.
Black sheets, No. 24 gage	£9 5s.		
Galvanized sheets, No. 24 gage	£11 5s.	to	£11 15s.

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at $4.86

*Ingots	£2 5s.		
*Billets, Thomas	£2 7s.		
Wire rods, No. 5 B.W.G.	£4 10s.		
Black sheets, No. 31 gage, Japan	£11 5s.		
*Steel bars, merchant	£3 2s.	6d.	
*Sheet bars	£2 8s.		
Plates, ¼ in. and up	£4 1s.	6d.	
*Plates, ⅜ in. and 5 mm.	£4 3s.	6d.	
*Sheets, ⅛ in.	£4 8s.	6d.	
*Ship plates	£4 10s.		
*Beams, Thomas	£2 19s.		
*Angles (basis)	£3 2s.	6d.	
Hoops and strip steel over 6-in. base	£3 17s.	6d.	
Wire, plain, No. 8	£5 7s.	6d.	
Wire nails	£5 15s.		
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.		

*Prices as established by European Raw Steel Cartel.

Raymond Bros. Forms Metallurgical Division

RAYMOND BROS. IMPACT PULVERIZER CO. announces the organization of a metallurgical division for supplying a full line of coal pulverizing, transporting and burning equipment for complete powdered fuel installations in the steel, malleable iron and allied industries.

This new department is under the direction of C. F. Herington, as manager, with headquarters at the Chicago office of the company. Mr. Herington is well known in the industrial field through his long experience in engineering work with Westinghouse, Church, Kerr & Co., the New York Central and Pennsylvania railroads.

For the past seventeen years he has been engaged in designing and placing in successful operation complete powdered coal plants on metallurgical furnaces of all types. During the last nine years of this period he was affiliated with Heyl & Patterson, Inc., of Pittsburgh, where he had charge of engineering, selling and the erection of pulverized coal plants such as the Erie Malleable Iron Co., the Raritan Copper Works at Perth Amboy, N. J., the smelter of the International Nickel Co. of Canada, also equipment for the smelters of the Union Minière du Haut Katanga in Africa and the Nouvelle Foundry in Belgium.

Large Order for Stainless Barrel Steel

ONE of the largest stainless steel orders on record has been placed with Republic Steel Corpn., Central Alloy Division, Massillon, Ohio, by the Firestone Steel Products Co., Akron, Ohio. The steel is to be used in the fabrication of the newly announced Firestone Insulated Stainless Steel Beer Barrel. The barrel is of double-walled construction with a lining of Enduro Stainless Steel insulated by dead air space from the outer shell which is ruggedly built of plain steel.

An outstanding feature of the new barrel is that the inner shell of corrosion-proof Enduro Stainless Steel is effectively insulated from outside heat. Lack of efficient insulation in the past has been one of the greatest drawbacks to metal beer barrels. When heat from the sun or an accidentally hot room penetrates through the container to the beer, the dissolved gases are released and the beer becomes "wild." The Firestone barrel effectively prevents this by means of the insulating construction.

The use of stainless steel for the lining of the barrel obviates the necessity of pitching and ends cooperage expense. Since the metal cannot affect the taste, clarity or color of the beer, it assures retention of flavor and quality of the beer while it is stored in the barrel. The barrel is made in standard sizes and incorporates a large number of structural features.

New Regulations Governing Railroad Purchases of Steel Are Adopted

COMMERCIAL Resolution No. 29, adopted by the directors of the American Iron and Steel Institute, Oct. 27, is designed to correct a situation under which railroads found it to their advantage, in many instances, to buy products from distant rather than nearby mills.

The code provides that all products, except rails of more than 60 lb. per yard for angle bars and rail joints, shall be sold at delivered prices equal to the published base price plus the published railroad freight rate to destination. Under this arrangement a railroad, for example, extending from Pittsburgh to Chicago would pay $1.90 per 100 lb. for tie plates at either terminus, since both are basing points. If the tie plates were required at Pittsburgh, they could be bought from a Chicago mill which would have to meet the Pittsburgh price of $1.90. This would mean that the railroad would benefit to the extent of the difference between the published freight rate and its own cost of transporting the tie plates from Chicago to Pittsburgh.

Under the new ruling, when the basing point is located on the line of the purchasing carrier, railroads will be required to pay the base price, plus 5 mills per ton per mile for the distance between the basing point and the place of delivery. In case the basing point is not located on the railroad, the delivered price will be computed by adding to the base price the all-rail freight charges which accrue on the shipment up to the time the material is delivered to the purchasing carrier, and then adding 5 mills per ton per mile for the haul over the line of the purchasing railroad.

No steel company is allowed to make any reduction from the delivered price by reason of transportation by truck, by water, or by any other means than by railroad.

No deduction from the published base price is permitted which will result in a delivered price less than the sum of the basing point quotation and the arbitrary switching charge at the basing point.

Commercial Resolution No. 29 Effective October 27, 1933

Preamble and Resolution adopted by the Board of Directors of the American Iron and Steel Institute Oct. 27, 1933, with respect to deductions from Base Prices of Products on Sale thereof to Common Carriers by Railroad.

WHEREAS Section 4 of Schedule E of the Code provides, among other things, in substance that prices quoted and billed by any member of the Code for any product, except as therein otherwise provided, shall be delivered prices, which shall be not less than the published base price of such member for such product at the time in effect plus the all-rail published tariff freight charges thereon from the basing point upon which such base price is based to the place of delivery thereof; and

WHEREAS in the purchase of products by common carriers by railroad published tariff freight charges are not properly a factor in the delivered price of such products to the extent that the purchasing carrier provides in whole or in part the service of transportation to the place of delivery of such products; and

WHEREAS the board of directors has determined that it is in the interest of the iron and steel industry and of common carriers by railroad and that it will not tend to defeat the policy of Title I of the National Industrial Recovery Act to permit any member of the Code, in selling products to any such common carrier by railroad, to make deductions from the published base prices of such member for such products then in effect such as will preserve to such purchasing carrier the advantage accruing to it from the performance by it of all or part of such service of transportation;

RESOLVED that, until otherwise determined by the board of directors, in the case of a sale of any product (except standard tee rails of more than 60 lb. per yard, angle bars and rail joints) by a member of the Code to a common carrier by railroad, when such product is shipped from the plant of such member of the Code to a place of delivery on the line of such purchasing carrier and the movement is entirely over the line of such purchasing carrier, or partly over the line of a connecting carrier or carriers and partly over the line of such purchasing carrier, the member of the Code selling such product to such purchasing carrier may allow a deduction from the published base price of such member for such product then in effect that shall not be greater than the amount, if any, by which (a) the lowest delivered price which could then be charged under the Code by such member for such product delivered at such place of delivery by all-rail transportation shall exceed (b) the lowest delivered price for such product at such place of delivery which could then be obtained by adding to any published base price (plus any extras required to be added thereto or less any deductions permitted to be made therefrom under Section 7 of said Schedule E) of such member for such product then in effect under the Code at any basing point an amount (in lieu of the published tariff freight charges thereon from such basing point to such place of delivery) computed as follows:

(A) In case such basing point is located on the line of such purchasing carrier, 5 mills ($0.005) per ton per mile for the total short-line distance over such line from such basing point to such place of delivery;

(B) In case such basing point is not located on the line of such purchasing carrier, the sum of

(1) the division or portion of the through published all-rail tariff freight charges which would accrue on the shipment of such product to

Last Minute Sales Leads

(Received too late for classification in our Plant Expansion Section)

Board of Directors, Sanitary District of Chicago, 910 South Michigan Avenue, Chicago, plans extensions and improvements in power plant at Lockport, Ill., including additional equipment. Cost about $800,000 with machinery. Financing is being arranged.

Wright & Taylor, Louisville, distillers, recently reorganized, plans early erection of new plant, with storage and distribution facilities. Cost about $400,000 with machinery. Thomas B. Bullitt is head.

United States Coast Guard Headquarters, Washington, asks bids until Nov. 14, for new seaplane hangar with shop facilities at Coast Guard Reservation, Biloxi, Miss., 100 x 120 ft. with two lean-to extensions, each 20 x 100 ft.

Hamilton Foundry & Machine Co., Lincoln Avenue, Hamilton, Ohio, plans rebuilding part of plant, including two foundry units, recently damaged by fire. Core department was destroyed. Loss about $50,000 with equipment.

Board of Public Works, Beaver Dam, Wis., asks bids until Nov. 21 for equipment for new sewage disposal plant, including gas storage tank and accessory equipment. Jerry Donohue Engineerng Co., Sheboygan, Wis., is engineer.

State Department of Mental Diseases, State House, Boston, has plans for new one-story mechanical shop at institution at Westboro, Mass. Cost about $28,000 with equipment. Monks & Johnson, 99 Chauncy Street, Boston, are consulting engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 14, for 75 electric arc welding sets (Schedule 1058) for Eastern and Western yards; 25 motor-driven engine lathes and spare parts (Schedule 1025) for Eastern and Western yards; one motor-driven radial drill and spare parts (Schedule 1031) for San Diego yard; five motor-driven turret lathes and spare parts (Schedule 1027) for Mare Island and Puget Sound yards; one motor-driven punch press (Schedule 1013) for Puget Sound yard.

New England Terminal Co., Tiverton, R. I., plans rebuilding bulk oil storage and distributing plant, comprising eight large steel tanks, pumping plant and other buildings, destroyed by fire Nov. 1. Loss about $800,000 with equipment.

Board of Works, Muskogee, Okla., plans new municipal electric light and power plant. Cost $1,260,000 with equipment. Federal loan is being arranged. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

United States Engineer Office, Philadelphia, asks bids until Nov. 14, for one oil engine unit, complete with accessories (Circular 205).

Public Works Officer, building No. 39, Navy Yard, Boston will close bids Nov. 22, for two gasoline-operated long-boom revolving cranes, either locomotive or traveling gantry type and a 60-ft. steel boom for locomotive crane now in use.

Electric Maintenance & Engineering Works, 143 Railroad Street, Woonsocket, R. I., has awarded contract for a two-story and basement machine shop.

carriers other than such purchasing carrier for the haul from such basing point to the point at which such shipment would enter upon the line of such purchasing carrier; and

(2) five mills ($0.005) per ton per mile for the total short-line distance over the line of such purchasing carrier from such point to such place of delivery;

provided, however, that no deduction from the published base price of any product by any member of the Code shall be permitted by this resolution which shall result in a delivered price for such product less than the sum of such published base price of such member at the basing point on which such base price shall be based and the arbitrary switching charge on such product at such basing point as provided in Commercial Resolutions Nos. 7 and 20 adopted by the board of directors on Aug. 29 and Sept. 20, 1933, respectively; and *provided, further,* that in the case of any such sale of any product to a common carrier by railroad at a deduction from the base price therefor of the member of the Code selling such product as hereinbefore provided, such member shall not pay, or make any allowance on account of, the freight charges on such product from the plant of such member to the place of delivery thereof in an amount which shall be greater than the sum of (1) five mills ($0.005) per ton per mile for the total short-line distance over the line of such purchasing carrier from the point where the shipment of such product shall enter upon the line of such purchasing carrier to such place of delivery and (2) the division or portion, if any, of the through published tariff freight charges accruing to carriers other than such purchasing carrier for the haul from such plant to such point; and *provided, further,* that in the case of any such sale such member shall not allow any reduction from the delivered price of such product determined as hereinbefore provided by reason of the transportation by other than all-rail transportation of such product for delivery; and

RESOLVED that this resolution shall be effective immediately.

Allis-Chalmers Licenses Makers of V-Belt Drives

THE Allis-Chalmers Mfg. Co., Milwaukee, after negotiations lasting 18 months, has granted licenses on a royalty basis to a number of concerns to produce its multiple V-belt drives. According to Walter Geist, general representative in charge of the sales organization, and inventor of the Allis-Chalmers texrope drive, there is a considerable market for this product, due to the trend of modernizing and rehabilitating industrial plants of all kinds. The product was first placed on the market by the company in 1924 and sales have run into many millions of dollars.

The firms licensed are as follows: American Pulley Co., Philadelphia; Dayton Rubber Co., Dayton, Ohio; R. & J. Dick Co., Passaic, N. J.; Dodge Mfg. Co., Mishawaka, Ind.; L. H. Gilmer Co., Philadelphia; Golden's Foundry & Machine Co., Columbus, Ga.; B. F. Goodrich Rubber Co., Akron, Ohio; Goodyear Tire & Rubber Co., Akron; W. A. Jones Foundry & Machine Co., Chicago; Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J.; Medart Co., St. Louis; Ohio Valley Pulley Works, Maysville, Ky.; Pyott Foundry & Machine Co., Chicago; Rockwood Mfg. Co., Indianapolis; T. B. Wood's Sons Co., Chambersburg, Pa.; Worthington Pump & Mfg. Corpn.. Harrison, N. J.

The licensed sheave manufacturers recently formed an organization with the title of Multiple V-Belt Drive Association. Mr. Geist has been elected president. A code has been drafted by the group under NRA.

Coast Port Prices On Rails Filed

NEW prices on standard T-rails weighing over 60 lb. per yard were filed with the American Iron and Steel Institute to become effective Nov. 9. In addition to mill prices the following prices are quoted at various Coast ports:

$37.37½ per gross ton, c.i.f. New Orleans, La.
$37.37½ per gross ton, c.i.f. Mobile, Ala.
$38.12½ per gross ton, c.i.f. Houston, Tex.
$38.12½ per gross ton, c.i.f. Port Arthur, Tex.
$38.12½ per gross ton, c.i.f. Galveston, Tex.
$40.37½ per gross ton, c.i.f. Pacific Coast ports.

The mill price of $36.37½ per gross ton is f.o.b. the following points: Bessemer, Pa.; Steelton, Pa.; Sparrows Point, Md.; Lackawanna, N. Y.; Gary, Ind.; Indiana Harbor, Ind.; Ensley, Ala.; Minnequa, Colo.

Harrisburg Company to Sell Reinforcing Bars

HARRISBURG PIPE & PIPE BENDING CO., Harrisburg, Pa., has resumed the fabrication and sale of concrete reinforcing bars after several years' inactivity in this line and has added a modern fabricating shop with a staff of reinforcement engineers familiar with all phases of concrete construction requiring reinforcement. The company re-enters this field hoping to participate to a substantial extent in the present extensive Federal and State building program and highway construction work. Charles C. Steel, who recently resigned as vice-president and general manager of sales, Sweet's Steel Co., Williamsport, Pa., has been named sales manager of this department.

W. H. Davey to Operate Empire Sheet Mill

THE W. H. DAVEY STEEL CO. has been formed to take over the Empire sheet mill in Cleveland, formerly a unit of the Empire Steel Corpn., Mansfield, Ohio, which was sold recently by the receiver. The company has a capitalization of $160,000 6 per cent bonds and 25,000 shares of no par common stock. W. H. Davey is president and treasurer of the new company. Other officers are: vice-president, H. L. Berno; works manager, E. M. Jones; secretary, W. R. Jenkins and assistant secretary, R. Easterday. The board of directors consists of Messrs. Davey, Berno and Jones and F. W. Beach, Harold Davey, D. R. James and T. B. Root.

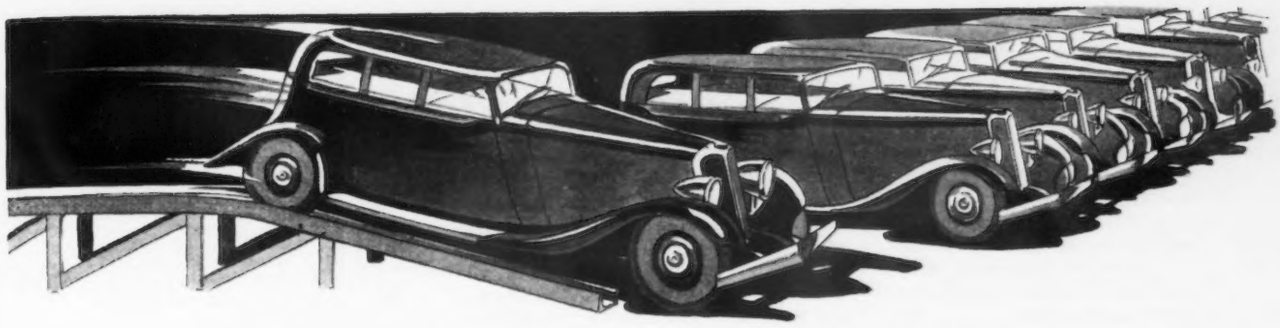
W. H. Davey is president of the Canton Tin Plate Corpn., Canton, Ohio. Mr. Beach formerly was sales manager of the Mansfield Sheet & Tin Plate Co., Harold Davey is Detroit sales manager of the Canton Tin Plate Corpn., D. R. James was formerly president of the Empire Rolling Mill Co. that operated the Empire plant in Cleveland several years ago, and T. B. Root is president of the George D. Harter Bank in Canton.

Black plate and cold finished black sheets will be manufactured by the new company. Four hot mills in the plant are being placed in operation this week.

Farm Equipment Exports Increase in September

WASHINGTON, Nov. 8—Exports of agricultural implements from the United States during September were valued at $1,412,839, compared with $836,536 in August and with $783,158 during September, 1932, according to the Commerce Department. Although gains were made in exports of all types of farm equipment, the increase in September was chiefly due to larger foreign sales of tillage implements, harvesting machinery, and tractors.

The chief implement market in September was Canada with a total of $160,000 made up chiefly of tractors, tractor parts and dairy equipment. The United Kingdom was second in importance with purchases valued at $144,000 consisting chiefly of wheel tractors and tractor parts. South Africa's total of $133,000 was due to large takings of tillage and harvesting equipment. Italy was an important purchaser during the month with $105,000 made up chiefly of tractors. New Zealand reached a total of $112,000 made up of harvesting equipment.



▲▲▲ THIS WEEK ON THE ASSEMBLY LINE ▲▲▲

New Models Not To Be In Production Until December; Many Plants Down

DETROIT, Nov. 6.

A CHECK-UP of October motor car production shows that assemblies probably did not exceed 115,000 to 120,000 units. Although this is approximately 30,000 units less than the industry anticipated at the beginning of the month, it is more than double the output in October, 1932.

What November's figure will be is impossible to predict, because of uncertain plans of several prominent companies. However, it is safe to say that it will show a severe shrinkage from October's and is likely to be in the 50,000 to 60,000 range. Practically all General Motors units will be down the entire month, so far as assemblies are concerned, although at the end of November the first few Buick cars may come off the line. The burden of holding up operations in the next few weeks, therefore, falls on the Chrysler Corpn. and Ford, and it is understood that neither has particularly ambitious programs for the near future.

It will be well into December before the industry begins to produce new cars in volume and even then expansion will be slow. It is conceded that dealers representing some of the important manufacturers will not have stocks, aside from one or two cars each, at the time of the automobile shows in January. That a car shortage will develop after the first of the year becomes increasingly clear. Certain car makers will not be in production by show time and in all probability will display hand-built models at the New York show.

The tool and die makers' strike is the largest single factor in causing delays, but eleventh hour changes in design of parts likewise are pushing back further the dates for the start of manufacture. Uncertainty regarding labor and materials costs, especially the latter, continues to contribute to unusual slowness in the tooling up process. General Motors is said to be in the best position in the industry with regard to completion of new dies. Some companies placed their tool and die work in local shops and kept it there for several weeks after the strike began before sending it to other cities free from labor trouble. They missed their guess that the strike would end in a week or two. The result is that they will be from two weeks to a month later than General Motors in introducing their new lines.

As is usually the case, Buick will be the first of the General Motors cars to be presented. Its Flint plant will be turning out parts this month, and assembled cars in small quantities may be produced before the end of the month. Public announcement probably will be in December. Chevrolet's local plants are reported to be planning on resumption of operations on Nov. 13, while motors for the new line will be in production at Flint before then. It is doubtful, however, whether any cars will be assembled this month. The new Chevrolet will be unveiled to the public near show time.

Year's Sales Far Ahead of 1932

Chevrolet made 37,699 cars in October, compared with 59,357 in September and 1205 in October of last year. Illustrating how far some automobile companies have progressed toward recovery, Chevrolet built considerably more units last month than its combined output in September, October and November of 1932. In the first 10 months of the current year Chevrolet manufactured 609,000 cars, as against 394,000 for all of last year and 782,000 for the full year of 1931. Chevrolet shortly will reopen its Janesville, Wis., plant, which has been idle more than a year. The plant was closed because of excessive taxes levied by the State of Wisconsin. It will assemble cars for a considerable area in the North-Central West.

Pontiac, Oldsmobile and Cadillac will not assemble any new models this month and will not reveal their hands until the New York show. It is understood that there will be more overlapping of prices between Pontiac and Olds than during the past year. It is said that in the changes subsequent to the appointment of W. S. Knudsen as executive vice-president of General Motors, Cadillac will be touched lightly, if at all. It has been occupied for months setting its own house in order by consolidating manufacturing operations on its several lines, so far as economically possible. Therefore, little remains to be done. One of Mr. Knudsen's main objectives is reported to be attainment of a stability throughout General Motors which has been absent in certain divisions. For example, there has been a considerable shifting in personnel the last two years in Buick and Oldsmobile, whereas Chevrolet has been relatively free from such upheavals.

Ford Complying with Code

Ford's relationship with the NRA still is first-page news, but of greater importance to suppliers of materials and parts are his plans for the immediate future. Admittedly, Mr. Ford has succeeded well lately in shrouding in secrecy much of his activities at Rouge and less is known about his program than for many months. The

truth seems to be that he is choosing to drift temporarily until he makes up his mind what kind of a market 1934 will afford him. His production last month is now put at about 22,000 units, but sales are believed to have been near the 35,000 mark. He evidently wants his dealers' field stocks reduced to a low point so that he will be in a position to do what he thinks best at the turn of the year. The model 44 (small V-eight) program is lying dormant, but could be revived and the car put into production in 30 to 60 days whenever Mr. Ford deems the market ripe for a car priced at $300. Meanwhile, production varies from 500 to 1000 cars a day. To comply with the automobile code provision that employees shall not average over 35 hr. a week in a six-months' period, Ford is laying off for a week at a time 9000 men until all its force at Dearborn is qualified. Although four open-hearths were recently being warmed up at the Rouge plant, there are no signs that they will be operated in the immediate future. However, the fact is fairly well established that these furnaces will be making steel by the end of the year, and perhaps sooner. It is said that their activities will be confined to production of alloy steels, with all plain carbon steel being bought outside. This was the plan being followed just prior to the shutting down of the steel plant in 1932.

Chrysler has had a slight production bulge in its Plymouth and Dodge divisions because of exceptionally good retail sales. Retail deliveries of the former totaled 5649 in the week ended Oct. 28. Chrysler's assemblies will slump sharply this month as various divisional plants go down for tooling up for new models. It is understood that no Chrysler car will be out prior to the New York show. Stocks in the hands of Hudson's dealers are the lowest since December, 1923.

Steel Buying Postponed

Postponement of new model production, of course, means postponement of the use of present heavy stocks of steel, and further pushes into the background the time when quantity purchases of steel will be made by the automobile industry. It is true that in the next 30 days some strip and sheet orders will be placed for sizes which were not known at the end of the third quarter, but in the aggregate the tonnage will not be large. The first sizable buying will be late in December, especially if prices are advanced for the first quarter. It is believed that the Chrysler Corpn. has laid in enough steel so that it will not be in the market for important tonnages until February.

The automobile industry is not reconciled to the provision in the steel code discouraging truck haulage of steel from mills to consumers' plants. President Alvan Macauley of the National Automobile Chamber of Commerce, talking over the radio Saturday evening, expressed the industry's unalterable opposition to provisions in several codes (including the steel code) discriminating against motor transportation. Automobile executives point out that these provisions tend to destroy the market for their products and likewise restrict the demand for steel. They have no intention of giving up the fight and are confident that at the first opportunity the plan will be discarded of allowing a steel consumer only 65 per cent of the all-rail freight rate when he is shipping by truck and compelling him to pay the trucking rate besides.

Detroit Notes

Studebaker, Nash and Packard escaped considerable grief by building dies for their new cars before the tool and die strike began. . . . Great Lakes Steel is still running six open-hearths, making ingots for stock. . . . Reo has been notified that it will be granted a patent on its self-shifting transmission. . . . Continental is understood to be through with its venture in building automobiles. No formal announcement will be made of its car's demise. In the first eight months of this year it registered only 1484 cars. . . . As soon as it completes its International Harvester contract, Willys-Overland will close its plant indefinitely. . . . Although General Motors is to decentralize in line with its traditional policy, the plan which has been worked out of interchanging some parts on different cars will not be disturbed.

Despite termination of the tool and die strike, it is not considered likely that volume production of new models will get under way until the latter part of December or that major car manufacturers will be able to display their 1934 lines until near show time in January. Without an increase in car prices an expansion of about 25 per cent in volume of output will be necessary to offset added costs under the NRA code, according to W. S. Knudsen, General Motors executive vice-president. It is reported that Ford may take its exposition of progress to New York and Chicago in January to compete with the automobile shows staged by its competitors. In point of attendance and general interest the exposition was by far the most successful industrial show ever held in Detroit.

Data Assembled as Trial Period of Code Closes

IN connection with the expiration of the 90-day trial period for the steel code, iron and steel companies were asked to file complete information by Nov. 8 on employment and wages for the month of October. The data will be used by the National Recovery Administration as a basis for a report to the President on the operation of the code and a recommendation as to the future of the code. The NRA report to the President must be submitted prior to Nov. 17.

The American Iron and Steel Institute has appointed a committee of traffic managers, the personnel of which is shown in the accompanying table.

Committee of Traffic Managers, American Iron and Steel Institute

H. C. Crawford, Chairman, Traffic Manager, Bethlehem Steel Co., Bethlehem, Pa.

J. A. Coakley, General Traffic Manager, United States Steel Corpn., 618 Carnegie Building, Pittsburgh.

H. E. Graham, General Traffic Manager, Jones & Laughlin Steel Corpn., Pittsburgh.

W. F. Morris, Jr., Vice-President, Weirton Steel Co., Weirton, W. Va.

H. D. Rhodehouse, General Traffic Manager, Republic Steel Corpn., Youngstown, Ohio.

W. J. Hammond, Traffic Manager, Inland Steel Co., Chicago.

R. K. Keas, General Traffic Manager, Laclede Steel Co., Arcade Building, St. Louis.

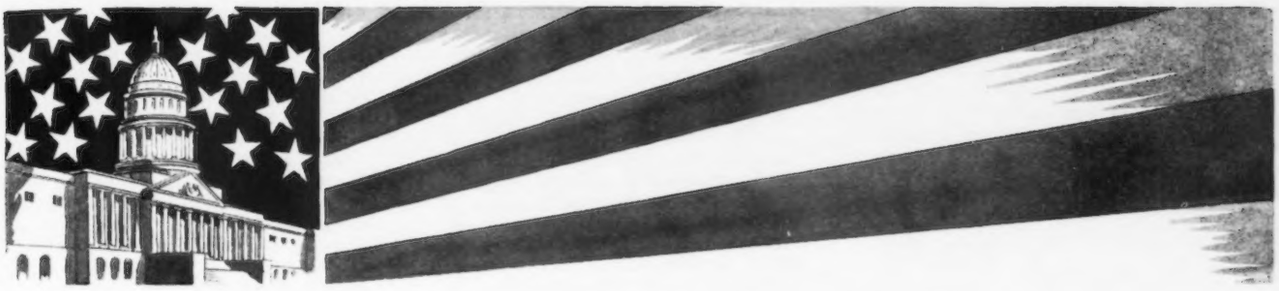
Carl Brown, General Sales Manager, Gulf States Steel Co., Birmingham, Ala.

W. D. Lewis, Traffic Manager, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

Book of A. S. T. M. Standards Now Available

THE American Society for Testing Materials has issued its book of A. S. T. M. Standards, a triennial publication containing all of the standard specifications, methods of test, recommended practices and definitions formally adopted by the society. The 1933 issue of this publication is composed of two parts—Part 1 containing all A. S. T. M. standards covering metallic materials; Part 2, all standards relating to non-metallic materials. Both parts aggregate 2300 pages.

Of the 185 standards in Part 1, 104 cover the ferrous metals, steel, wrought iron, pig iron and iron castings and ferroalloys, while 70 relate to nonferrous metals, including aluminum and magnesium alloys, copper and copper alloys, lead, nickel, zinc, bearing metals, solder metal, deoxidizers, electrical-heating and electrical-resistance alloys. Eleven of the standards involve metallography and general testing methods. Copies of the book can be obtained from A. S. T. M. headquarters, 1315 Spruce Street, Philadelphia, at the following prices: Either part, $7.50; both parts, $14.



THIS WEEK IN WASHINGTON

Industry Asks for Self-Regulation

Swope Plan Offers Relief From Federal Domination, Even Though Meeting Wide Criticism

By T. H. GERKEN
News Editor, THE IRON AGE

WASHINGTON, Nov. 8—Despite violent objections from many sources and a belated attempt on the part of the proponent to minimize its significance, presentation of the now widely discussed Swope plan for the control of industry was the outstanding development in Washington last week. Although the president of the General Electric Co. later expressed mild surprise at the widespread publicity given to his address before the Commerce Department's business advisory and planning council and also deplored the misunderstanding and misinterpretation given his utterances, he probably spoke for a great majority of United States industrial leaders who have sought relief from objectionable features of the NRA, while at the same time desiring to retain its valuable and practicable features.

Mr. Swope's plan for business self-regulation with Federal supervision to be exercised only in a negative way met with instant criticism from labor as represented by the Labor Advisory Board of the NRA and from the consumer public which was able to become articulate through the Consumers' Advisory Board. The third major consultant group to the Recovery Administration, the Industrial Advisory Board, from which Mr. Swope is now retiring under the rotation plan, divided on the issue, with Robert E. Lund, president of the National Association of Manufacturers, offering serious objections. Perhaps its staunchest championship came from Gen. Hugh S. Johnson, national recovery administrator, although he hastened to deny that Mr. Swope's statement, coming as it did from a retiring member of the Industrial Advisory Board, suggested any immediate conclusion of NRA activities. His statement follows:

> The Swope plan does not propose the slightest interference with NRA or with Government participation, supervision and absolute veto power on anything done by any organized industry under any code or Code Authority, or with exclusive governmental control of any penal sanctions of the law.
>
> It is an ultimate ideal of such an industrial organization as will enable the NRA to control industry, leaving to industry the right to discipline itself in the first instance. The National Industrial Recovery Act specifically provides for and intends the organization of industry into associations, subject to governmental control, and the Swope plan is intended to follow closely the pattern laid down in that Act.
>
> The Swope plan assumes organization and representation of labor throughout along lines already developed in NRA and perhaps best exemplified in the bituminous coal code, but it could not propose any specific pattern for labor organization because, under NRA, labor has the right to select its own form of organization.
>
> Nothing will disturb the present balanced organization of NRA with industrial, labor and consumers' representation in every hearing, in every discussion of policy, and in respect of every action.

Suggested in 1931

Critics of Mr. Swope's plan were quick to point out that he suggested similar business procedure in a paper delivered two years ago which he called "Stabilization of Industry." At that time many of the ideas seemed rather advanced and theoretical. In the intervening period industry has found itself forced to accept many of those seemingly theoretical ideas, and under the NRA has been swung much further to the left. The current Swope plan offers a welcome return to a middle ground which two years ago seemed to represent the farthest reaches of conservative thought. Its acceptance today by many who turned from it only a short time ago thoroughly exemplifies the extent of the economic revolution of the last six months.

In a sense, the Swope plan is a direct challenge to American business. Industrial leaders have found the NRA unsuitable to normal business relationships, even though it has much to offer of a constructive nature. This being the case, argues Mr. Swope, you must suggest something to take its place. In his own words, "if industry does not organize and govern itself, either the State or Federal Governments will—with the consequent paralyzing effects upon initiative and progress." It is difficult to controvert this logic.

A 10-Point Program

The Swope plan, as presented to the Business Advisory and Planning Council for the Department of Commerce, is as follows:

> 1. The body of each trade association will elect the executive authority to carry out the provisions of the code—sometimes called the "code authority"—which will be the board of directors, the executive committee, or a committee specially selected for that purpose, on which body will be one or more representatives appointed by the National Recovery Administration or the department of the Government taking over this work perma-

nently. Such representatives of the Government will protect the public and consumer interest, and will receive all data and information that are available to the board of directors, or executive committee, as well as the minutes of the meetings of the board of directors, the executive committee and any other committees of the association.

2. In accordance with the code, members of each trade association shall report regularly to its governing board and through it to the National Recovery Administration, or the department of the Government taking over this work permanently, such data and information as may be called for from time to time. Each codified trade association, as it becomes more familiar with the essentials of its work and responsibilities, will study the data collected, study the trends of its industry, endeavor to coordinate production and consumption, all of which should lead to a greater degree of stabilization of industry, with consequent benefits to employer, stockholders, employees and the public.

Favors New Chamber

3. If the governing board of the codified association is unable to exact compliance with the code of any recalcitrant member, the complaint shall be laid before the Federal Trade Commission, or the Department of Justice, or both.

4. At the present time there exist trade and industry organizations in many States and other geographical divisions of the country, and such associations have performed and can perform useful functions. It is suggested that such divisional associations be grouped together within the same geographical boundaries as defined for the Federal Reserve Districts, so that the information and statistics compiled by such trade groups will be available for interpretation and study on a comparable basis with the information compiled by the Federal Reserve Banks in such district.

5. In the larger cities, also, there are merchants' associations and chambers of commerce, and these, too, can be coordinated with the work of the larger geographical divisions and the national codified associations. Such local chambers of commerce and State or district trade associations will be especially concerned with such matters in their particular geographical divisions and might send delegates to the meetings of the national body.

6. There shall be a National Chamber of Commerce and Industry located in Washington, which may well be an enlargement and development of the present Chamber of Commerce of the United States, with the necessary reorganization along the lines of this program. The three main divisions of the National Chamber of Commerce and Industry will be:

(a) Commerce or Trade—In this division will be the various codified national retail and wholesale distributing associations, and those of kindred interest will be grouped together.

(b) Industry or Manufacturing—In this division will be the various codified national manufacturers' associations, such as the Textile Institute, the American Iron and Steel Institute, etc. Codified associations having kindred interests will be grouped together, such as the present National Association of Manufacturers or the National Metal Trades Association.

(c) Associations representing local or geographical divisions.

Statistical Bureau Planned

7. There shall be an economic and statistical bureau of the National Chamber of Commerce and Industry, of which the highly organized and efficient National Industrial Conference Board of New York shall be the nucleus, and in which such other independent economic and statistical bodies now supported by merchants and manufacturers may be incorporated. All statistical reports and data from each national codified association shall be sent to the economic and statistical bureau of the National Chamber of Commerce and Industry in Washington, and to the National Recovery Administration or department of the Government taking over this work permanently. In this economic and statistical bureau will be centered the study of all statistical information. The tabulation and interpretation of such will be published from time to time.

8. In unifying the efforts of trade associations, standardization and simplification of products becomes even more important than in the past. The Bureau of Standards of the Department of Commerce of the United States has in the past done notable work, but now finds this work much curtailed because of lack of funds. Industry has also carried on such work through the American Standards Association, supported by subscription of a comparatively few companies. It is proposed that the National Chamber of Commerce and Industry will establish a Bureau of Standards, in which will be incorporated the American Standard Association and such of the work of the Bureau of Standards of the Department of Commerce as the Government thinks it desirable to have undertaken by this bureau.

9. The delegates of the National Chamber of Commerce and Industry shall elect a board of governors. The board of governors shall elect its officers and an executive committee. The Secretary and Assistant Secretary of Commerce of the United States shall be members of the board.

The board shall elect a panel of members, which will sit in Washington and act as a board of appeals on any questions that may arise in the interpretation and enforcement of the national code provisions, and will endeavor to see that such interpretations are consistent. On this panel will also sit such number of representatives as may be appointed from time to time by the President of the United States. It is the desire to secure as members of these panels the highest type of business men to cooperate with the Government, and, therefore, not to make this too burdensome, membership on the panel shall be limited to not more than four (4) months, and the panel shall be divided into fourths so that each month one-fourth of the panel will retire and another fourth take up the work.

10. Almost every manufacturer or merchant now belongs to and subscribes to a number of local, State, divisional, or national associations, in addition to organizations bringing together manufacturers or merchants of similar interest, and to organizations for other purposes. Under this plan, each manufacturer or merchant would, of course, belong to his particular codified national association and pay by pro rata assessment the expenses of conducting the association, which would include the necessary expenses of the National Chamber of Commerce and Industry. An organization such as this briefly sketched would unify industry and commerce. It would consolidate the many demands on manufacturers and merchants for contributions and support, and make these various efforts more effective and less costly. Its information would be comprehensive and reliable.

This is the skeleton of the machine—how effective it would be depends on its leadership. Its leadership depends on the serious consideration and active and continuous participation of business men. Evidence of this new attitude has been seen in the development of codes of fair competition. With such participation and leadership, the National Chamber of Commerce and Industry could speak with authority—it would be in a position of responsibility and could be held accountable by the public. It could speak and act for commerce and industry on legislative problems, on questions of finance and transportation and work out, nationally, better methods of promoting and maintaining good and continuous relations with employees and consider with their representatives plans that will promote greater well being and security for them.

Along such lines can the initiative and leadership which has been responsible for the rapid progress and development of American industry and commerce be retained. Along such lines can the advantages of mass production and mass consumption, with the consequent benefits of lower prices to the public and therefore making the products of the machine available to an ever larger number of the people, be continued.

Praises the NRA

Further amplifying his original statement in a radio address on Nov. 4, Mr. Swope said:

I have the greatest respect for President Roosevelt and am and have been glad to give my service to promoting the great work that he is doing with so much courage. Of General Johnson's leadership of the NRA, I cannot say enough in praise of his great ability, dynamic energy and wholehearted, untiring devotion. Under his leadership and the support of the President the National Recovery Act has accomplished wonders, more than any one would have believed possible in the less than five months it has been on the statute books.

Not the least of its difficulties has

been to get the companies in the same industry to agree, and some of the great things that it has accomplished and is accomplishing are the stoppage of the degradation of industry which had been rapidly taking place through the introduction of long hours, with unbelievably low pay and conditions of work that went back to the days of the sweatshop; the elimination of child labor; explicit recognition of the right of collective bargaining.

But the National Recovery Act expires by limitation in June, 1935, or earlier at the discretion of the President or Congress. The foundation that has been laid by this act and the splendid beginning of trade associations under it give me hope that after June, 1935, the essentials of operations under the act will be continued. It is none too early, therefore, to begin to have consideration given by trade and industry as to how it is going to organize itself to discharge its obligations.

The question whether the splendid beginning made by such codified trade associations may continue after the act terminates depends largely upon the conduct of the associations themselves. It is essential that they give due recognition to the rights of workmen and the maintenance of a high standard of living, which can only be accomplished by an adequate wage, with such hours as will spread employment and with good working conditions.

NRA to Continue

No concrete results are immediately to be expected from the Swope statement. Although official comment was not forthcoming from the White House, assurance has been given that the Recovery Administration will not terminate its activities with the completion of industrial codification late this year or early in 1934. Labor is expected to cling tenaciously to the advantages it has been offered and just as quickly seized. Its objections to the Swope plan have not yet become concretely articulate. William Green was not in Washington when the Swope statement appeared. Mr. Lewis is very busy with the anthracite miners.

Consumers Demand Protection

The Consumers' Advisory Board to the NRA created a committee to confer with the committee of the Business Advisory Council of the Commerce Department to which the Swope plan has been referred for study. The consumers' committee was charged with the following requirements, which, it was felt, must be met by any plan for industrial control if it is to serve adequately the general public interest, as well as the more specialized interest of the consumer:

(1) There must be recognition that there are three parties in industry—the consumer, labor, and the management-ownership group.

(2) The Government, as representative of all three, must be in a fully authoritative position to impose checks and balances in order that no one of these parties should be placed in a position to dominate another.

(3) Whenever the management-ownership group is granted relief from the regulating influence of competition in determining prices and other vital terms in economic bargains, the other parties to the bargain must be equally strengthened, either through Government regulation or by giving them equal representation in any bodies which establish the conditions under which transactions take place—both conditions affecting price and affecting quality.

Dutch Pig Iron Sales Grow in World Markets

WASHINGTON, Nov. 8.—Production of pig iron in the Netherlands during the year ended March 31, 1933, amounted to 233,000 tons, of which approximately 216,000 tons or about 90 per cent was sold in foreign markets, according to a report to the Department of Commerce from Vice-Consul W. M. Chase, Amsterdam. The year's output was approximately 85 per cent of normal production.

While Dutch pig iron exports represented only about 15 per cent of the combined totals of the chief European countries and the United States in 1929, they had risen to 60 per cent in 1933. In the meantime world demand declined approximately 75 per cent while the Netherlands exports increased 9 per cent.

Taylor and Flanders Named to NRA Board

WASHINGTON, Nov. 8.—The steel and the machine tool industries will be prominently represented in the National Recovery Administration over the next four months, with the appointment on Nov. 1 of Myron C. Taylor, chairman, United States Steel Corpn., New York, and Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., to its industrial advisory board. Others appointed to serve on the board under the rotation of membership plan announced last week by Secretary of Commerce Roper were Pierre duPont, president, E. I. duPont de Nemours & Co., Wilmington, Del.; Clay Williams, Winston-Salem, N. C., and Gen. Robert E. Wood, Chicago.

Retiring from the board at that time were Gerard Swope, president, General Electric Co., Schenectady, N. Y.; Walter C. Teagle, chairman, Standard Oil Co. of New Jersey, New York; James A. Moffett, formerly vice-president, Standard Oil Co. of New Jersey; Austin Finch, Thomasville, N. C., and James B. Elliott, Los Angeles. Mr. Teagle's position as chairman of the board will be filled by Robert E. Lund, president of the National Association of Manufacturers, St. Louis.

Under the rotation plan, four more members of the board will be replaced on Dec. 1, while on Dec. 31 those remaining of the original membership will retire in favor of other leading industrialists.

Orders for Fabricated Steel Plate Decline

WASHINGTON, Nov. 8.—New orders for fabricated steel plate as reported by 48 manufacturers during September to the Bureau of the Census declined to 15,637 net tons from 16,320 tons in the preceding month, although registering an increase over the 11,109 tons booked during September, 1932.

January - September orders were 151,399 tons this year, as compared with 127,681 tons in 1932 and with 246,960 tons in 1931.

National Founders Name Convention Speakers

THE National Founders Association has announced the program for its annual convention which is to be held at the Waldorf-Astoria Hotel, New York, on Wednesday and Thursday, Nov. 15 and 16. At the first session Wedneday morning, S. Wells Utley, president of the association, will open the convention with an address on "The New Deal," following which Virgil Jordan, president of the National Industrial Conference Board, Inc., New York, will speak on "The New Deal and Some Old Delusions."

At the luncheon meeting Wednesday, L. A. Hawkins, executive engineer in the research laboratory of the General Electric Co., will talk on "Scientific Certainties and Economic Doubts."

"Freedom of Private Enterprise as Related to Business Recovery," will be the subject of the first address at the afternoon session Wednesday by G. L. Lacher, managing editor of THE IRON AGE. Also at this session are scheduled papers on "NRA Codes—the Short View and the Long View," by Gilbert H. Montague, New York attorney; "Stalin, Mussolini or Roosevelt—Which Has the Answer?" by Whiting Williams, Cleveland, and "Economic Fallacies of the NRA," by G. W. Dyer, professor of Economics, Vanderbilt University, Nashville, Tenn.

At the Thursday morning session, E. O. Jones, consultant for the association, will discuss "Control of Dust at Its Source," and Alfred C. Hirth, Toledo, Ohio, attorney, will speak on "Legal Aspects of Dust in Industry."

Railroads Allotted $135,000,000 for Rail Purchases and P.R.R. Electrification

WASHINGTON, Nov. 7.—The Administration's efforts to stimulate the heavy industries through public works funds were given tremendous impetus last week with the allotment of $51,000,000 for the purchase of rails and track fastenings by a number of railroads and of $84,000,000 to the Pennsylvania Railroad for the completion of its electrification program between New York and Washington and for related improvements in the construction of locomotives and passenger and freight cars.

The rail and accessory allotment was announced almost immediately after rail manufacturers agreed to a compromise price of $36.375 a ton for rails, following a month's controversy with Federal Coordinator of Transportation Joseph B. Eastman. Current prices on accessories are believed to be satisfactory to Mr. Eastman in view of the large number of makers and the wide use of patented appliances. According to the PWA, the sum allotted will be sufficient for the purchase of 1,000,000 tons of rails and 400,000 tons of track accessories, and many of the carriers have already reiterated their intention to take advantage of the opportunity to finance purchases.

The railroads are expected to apply individually for the required funds. Four per cent interest will be charged on the secured loans, with no interest payable during the first year. Maturities of the loans will be "within the useful life of the equipment, which in addition to rails and fastenings include such equipment as freight and passenger cars, locomotives and structural betterments of right of way." The carriers may make their purchases in the usual way from their usual sources of supply, and delivery is understood to be expected to be made prior to March 31, 1934. If the promised tonnage is ordered the country's rail-making capacity would be fully engaged for more than three months.

Pennsylvania to Buy Cars

The Pennsylvania will utilize its loan immediately with expenditures to continue through 1934 and early 1935, only $5,000,000 to be spent in the latter year. Approximately $16,000,000 will be spent on the construction of 7000 freight cars to supplant an equal number of old cars which will be dismantled. Construction will begin immediately and continue through 1934, requiring approximately 120,000 tons of steel.

Electrification Details

The incomplete work on the electrification program is as follows:

(1) Fabrication and placing of approximately 2500 towers to carry the overhead wiring in addition to the 1800 already in place. Placing of the overhead wiring between Wilmington, Del., and Washington and construction of sub-stations to supply the current for those wires.

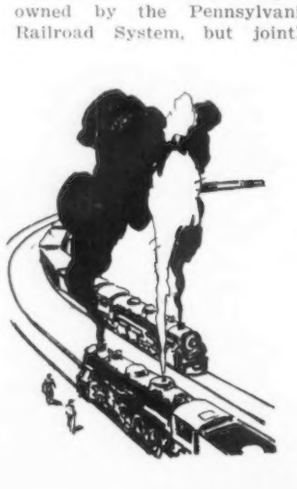
(2) Construction of electric passenger locomotives and freight locomotives sufficient for the section of road not yet electrified. The present number of electric passenger locomotives and multiple unit cars is only sufficient for the present electrically operated sections between New York, Wilmington and Paoli, Pa.

(3) Changes of line at Elkton, Md., to eliminate grade crossings, curvatures and hazards of operation and provide a four-track connection where a two-track connection previously linked separate four-track sections.

(4) Improvements in clearance and roof conditions in the present Union Tunnel through which the line passes leaving Baltimore en route to Philadelphia. A new double track tunnel of enlarged dimensions is contemplated and upon its completion, the present double track tunnel may be relined and placed in service as single track line, thus giving three tracks all signaled for movements in both directions through the tunnels.

(5) Reconstruction of the Virginia Avenue tunnel in Washington owned by the Pennsylvania Railroad System, but jointly used with the Baltimore & Ohio to give necessary clearance for electrification and permit car units of large dimensions to move through the tunnel without rerouting around Washington.

(6) Construction of additional electrification facilities to complete electric freight operations to Washington and Potomac Yard, Alexandria, Va., which requires major expenditures in New York and Philadelphia terminal zones and minor outlays at intermediate points.



A schedule of proposed expenditures shows that for roadway equipment a total of $44,850,000 will be required, with $39,580,000 spent during 1934, and $5,000,000 carried over to 1935. This includes completion of work on the right-of-way freight and passenger yards, sub-stations, switching stations, electrification equipment and material, contractors' materials and overhead, contractors' labor, telegraph and signal system, labor and supervision, electrification labor and supervision, engineering, and similar items.

The schedule shows $16,525,000 to go for electric locomotives, including 16 passenger locomotives, 60 freight locomotives, 14 switching locomotives and conversion of 30 freight and switching locomotives from D. C. to A. C. current. About $1,087,000 will be spent in 1934 for multiple-unit passenger cars. For the Baltimore and Washington tunnels and the Elkton, Md., reconstruction $5,402,477 will be required, all to be spent in 1934.

A time schedule for expenditures indicates that $2,500,000 will be used before Dec. 1 on the various types of work involved. The schedule then steps up to $4,500,000 for December, 1933, and goes forward to a practically uniform rate of approximately $6,000,000 monthly during 1934, with slight variations caused by seasonal and other conditions.

Arizona Irrigation Project to Begin

The PWA has allotted an initial $4,000,000 to begin construction of the $18,912,000 Verde irrigation and power project in Arizona. The proposed construction in the Salt River Valley will consist of dams, reservoirs, canals, lateral systems and power development for the irrigation of about 80,000 acres. The project will be self-liquidating, repayment to be made by users of water under the Reclamation Act.

Other outstanding allotments announced during the week include $1,350,000 to the Veterans' Administration for the acquisition of a site and the construction of a neuropsychiatric hospital near Roanoke, Va.; $1,333,000 to assist in the financing of the Harms Park housing project at Chicago; $663,000 to assist in the financing of the Sunshine apartments at Richmond, Va., and $1,054,000 to the Corps of Engineers, War Department, for harbor improvements at Huron, Sandusky and Fairport, Ohio.

Allotments during the week to 41 non-Federal miscellaneous projects in 15 States amounted to $13,578,855 and included $7,500,000 for a power-irrigation development in the Platte River Valley of Nebraska; $1,295,000 for a school at Utica, N. Y.; $738,000 for a power plant at Fort Collins, Colo.; $650,000 for a water works at Hyattsville, Md.; $470,000 for an administration building for a State prison camp at Bordentown, N. J., and $413,000 for a water filtration plant at Michigan City, Ind.

Steel Castings Orders and Production Lower

WASHINGTON, Nov. 8.—New orders for commercial steel castings during September amounted to 22,714 net tons, according to reports to the Bureau of the Census from 128 establishments having a monthly capacity of 146,900 tons. This compares with 28,962 tons in August and with 11,882 tons in September, 1932. In the first nine months of the year orders called for 184,753 tons, as compared with 117,684 tons in the comparable 1932 period and with 329,941 tons in 1931.

Steel castings production also declined in September, having been 25,532 tons, as against 31,157 tons in the preceding month and 11,334 tons in August, 1932.

Automotive Exports Up in September

WASHINGTON, Nov. 8.—Exports of automotive products from the United States during September were valued at $8,610,000, compared with $8,327,485 during August and $5,258,269 for September, 1932, according to the automotive-aeronautics division, Commerce Department. With the exception of March, 1933, when exports of automotive products were valued at $9,999,388, the September, 1933, valuation was the highest recorded for any month since October, 1931, when sales abroad totaled $9,947,300.

The improved trade during September resulted from the increased foreign requirements for low capacity trucks and certain items of automotive products included in the miscellaneous classification.

Several Codes Approved by President—Hearings Being Held Regularly

WASHINGTON, Nov. 8.—The National Recovery Administration has announced approval by the President of codes of fair competition for the fabricated metal products, steel castings, copper and brass mill products and petroleum equipment industries. During the week, public hearings have been held on codes for the Bolt, Nut and Rivet manufacturers, the special tool, die and machine shop industry, the alloy castings group, the elevator manufacturing industry and feldspar producers. Announced for early hearing are codes for the gear manufacturing industry, the gray iron foundry group, the foundry equipment industry and the engineering inspection industry.

Fabricated Metal Products Code Embraces Wide Field

In his report to the President recommending approval of the code for the fabricated metal products manufacturing and metal finishing and metal coating industry, Administrator Johnson pointed out that the large number of units in this industry manufacture literally thousands of articles in common use. Hundreds of manufacturers produce many diversified items. The application of separate codes to these different items would cause confusion and in many cases create impossible operating conditions.

On Aug. 10 approximately 60 trade association representatives and many individual manufacturers met informally to discuss the problems involved in formulating a code to cover the thousands of small shops throughout the country manufacturing metal specialty goods. At this meeting the Fabricated Metal Products Federation was formed and a basic code prepared to cover the whole industry. In order that interested parties might be advised, individual notice of hearing was sent to 7700 concerns, in addition to the standard form of notice and a copy of the basic code.

In normal times this industry operated on schedules of 50 to 55 hours a week. With the adoption of the 40-hour week provided in the code it is estimated that there will be an increase of persons employed, on the basis of activity, of approximately 25 per cent.

The industry estimated, using as its basis the United States Census of Manufactures and Bureau of Labor statistics, that during the period 1926 to 1929 there were normally employed 350,000 persons. The federation estimated that at present there are 313,752 employees in the industry, an increase of approximately 109,237 since March of this year.

A maximum work-week of 40 hours is provided in the code, with a tolerance up to 48 hours in any one week in certain contingencies to meet seasonal or peak demand in some branches. A minimum wage of 40c. an hour for male employees and 35c. for female workers engaged in the processing of products is prescribed for the northern wage district and a minimum of 35c. and 30c. respectively for the southern wage district. The minimum prescribed for office workers ranges from $15 per week in cities of more than 500,000 population down to $12 per week in communities under 2500.

Steel Castings Industry Adds 3000 Workers

The Steel Castings Industry code provides for a 40-hour week averaged over an eight-week period with the proviso that no employee may be employed more than 48 hours or more than six days in any one week. Office employees are limited to 40 hours of work per week. The rates of pay vary from 40c. an hour in the northern wage districts to 25c. an hour in the southern wage districts. The hours and wages closely follow those provided in the code for the steel industry. Office and clerical employees are to receive a minimum of $15 per week, except that office boys and girls may be paid 80 per cent of this minimum. Equitable adjustments in wage rates over the minimum are provided for.

It is estimated that operation of the approved code will increase employment in the industry by 3000 additional workers, and add $2,608,000 to the annual payroll.

Bolt, Nut and Rivet Code Hearing

The code for the bolt, nut and rivet industry was presented by R. J. Whelan, president of the American Institute of Bolt, Nut and Rivet Manufacturers, an organization which claimed to speak for 70 per cent of the firms and 90 per cent of the industry's value of production. In a brief statement, Mr. Whelan pointed out that this industry was a branch of the steel business, and that many of the provisions of the steel code necessarily had been incorporated in the code under consideration. He testified that whereas production by the industry had amounted to 700,000 tons in 1929, with sales valued at $120,000,000, estimated sales for 1933 would be only $30,000,000. Employment, however, has risen from 7489 on June 1, 1933, to 11,189 on Aug. 1 of this year.

As an addendum to his statement in support of the code, Mr. Whelan declared that the industry would have no objection to formulation of a separate code or codes for manufacturers

of cap and set-screws, machine screws, machine screw nuts and wood screws.

Separate codes were filed immediately by L. B. Lockwood, representing the makers of a number of allied products which also were manufactured by firms in the bolt and nut industry; by Miss E. K. Ready, representing the Fabrication Metal Products Federation; by John A. Kratz, representing the National Association of Farm Equipment Manufacturers; and by William B. Henderson, representing the Machinery and Allied Products Institute. All of the above sought to have their production removed from control of the code being considered, and acknowledgment of their request was made by Charles R. Ferguson, chairman of the institute's code committee, who stated that it was not the purpose of the code proponents to include any production except the manufacture of bolts, nuts and rivets for resale commercially.

Clarence Carlin, of the Anthony Carlin Co., Cleveland, offered an amendment to remove ambiguities from the code's list of definitions. He asked also that the code be administered by a commissioner, who would be appointed by the President and be a person without financial interest in the industry. Mr. Carlin further requested that any statistical data to be gathered from the industry be collected by disinterested public accountants, who would not request intimate details regarding the volume of individual sales nor the names of any customers.

Speaking in defense of the code's labor provisions, James C. Rea, representing the American Institute of Bolt, Nut and Rivet Manufacturers, testified that less than the 40-hour maximum week proposed to the code would prove oppressive by the smaller manufacturers. He stated that 40 hours represented a decrease of 33 per cent from the 60 hour work week in 1929, and that the shortened week would absorb virtually all of the present unemployed in the industry.

After criticizing the code's proposal to guarantee pieceworkers no more than the minimum rate for common labor, Deputy King asked Mr. Rea for a statement regarding employment in the industry. The witness testified that there were 17,228 employees in 1929, who worked 60 hours

a week and received average minimum wages of 44.2 cents an hour. The Deputy then reported that these figures showed an average weekly income to the worker in 1929 which was much more than twice the average weekly income under the rates proposed by the code. Mr. Rea stated that the number of hours worked per week had been reduced.

C. S. Reynolds, vice-president of the American Trucking Association, objected to a provision for making prices subject to all-rail freight tariffs from basing points to points of delivery. He stated that this was "monopolistic and discriminatory" in that it provided for the licensing of one industry by another. He stated that tariff rates for trucking had been filed by his association in 40 states and that his group now was negotiating with the steel industry for revision of a similar provision in that industry's code. He asked that costs be based on f.o.b. delivery at a basing point, and that the matter of transportation be left to the purchaser.

Mr. Ferguson replied that when the industry had received from the Interstate Commerce Commission schedules of rates covering truck transportation, it would take such rates into consideration in its selling price. He declared that there was no present regulation of truck rates, and stated that he was agreeable to Deputy King's suggestion that he discuss this matter with Mr. Reynolds.

John G. Turnbull, representing the Nelson Rivet Co., Taunton, Mass.. asked that the code's credit terms specify the customary 2 per cent discount for payment in 10 days. To this Mr. Ferguson objected that the witness represented only a minor section of the industry, and that the practice of his own firm was to sell on terms of 30 days net.

Deputy King questioned Mr. Ferguson regarding the proposed open-price plan, which the witness stated had not been tried by the industry since the Sherman Act. Deputy King then called attention to a consent decree entered against the Bolt, Nut and Rivet Manufacturers Association on March 17, 1931, in the District Court of the United States for the southern district of New York, by which the defendant was enjoined and restrained from concertedly establishing basing points. This brought a statement from Mr. Ferguson that it was this enjoined privilege which code proponents were seeking today, and that it was vitally necessary to their business. G. P. Byrne, speaking for the same group represented by Mr. Lockwood, asked that the code clearly define the products which it contemplated covering. He was followed by Mr. Turnbull who objected that the weighing of votes by the volume of business done would place administration of the code under the control of relatively few members of the industry. He suggested that it would be much fairer if each member of the code should have one vote regardless of the volume of his production.

In adjourning the hearing, Deputy King stated that there had been a great many objections voiced by the NRA legal department regarding clauses of "questionable legality" in the code. He suggested that members of the code committee meet with representatives of the legal department and with members of the NRA labor advisory board in further conference to work out an acceptable code for presentation to the President.

Special Tool, Die and Machine Shop Code Heard

With labor representatives charging that they had been forced to work 12 hours per day, seven days a week and sometimes as much as 133 hours in a week, and representatives replying that Sunday work was the exception rather than the rule, the Special Tool, Die and Machine Shop Institute presented its proposed code of fair competition for the industry at a pub-

SCHEDULE OF CODE HEARINGS

Hearings	Number	Starting Date	Place	Deputy Administrator	Association
Gear Manufacturing Industry	240	11-8-33	Willard Hotel, Fairfax Room	Malcolm Muir	American Gear Manufacturers Association
Gray Iron Foundry Industry	255	11-9-33	Carlton Hotel, Carlton Room	H. O. King	Gray Iron Founders Society, Inc.
Commercial Refrigerator Industry	250	11-9-33	Raleigh Hotel, Small Ballroom	Malcolm Pirnie	Commercial Refrigerator Manufacturers Assn.
Foundry Equipment Industry	258	11-10-33	Carlton Hotel, Carlton Room	Malcolm Muir	Foundry Equipment Manufacturers Association
Engineering Inspection Industry	267	11-24-33	Mayflower Hotel, Pan Amer. Room	Malcolm Pirnie	Engineering Inspection Group

lic hearing before Assistant Deputy Administrator George S. Brady.

Roy T. Wise, chairman of the Institute's code committee, presented the code and discussed the necessity for great tolerance in hours for "individualists" who must finish a job upon which they are engaged.

"In making a tool or machine," he declared, "the individualist can no more turn over his work to someone else to complete than a painter can partially complete a painting and then hand it to another painter to finish."

Discussion hinged chiefly around the definition to be given to the industry in the code, representatives of concerns making "special machinery and special machine parts" protesting against being included under the definition and Mr. Wise querying the Administrator whether or not the exclusion of the above terms would prevent the members of his organization from manufacturing that type of product.

Representatives of labor bitterly assailed the maximum hours and minimum wage clauses, R. S. Newham, of the American Federation of Labor, protesting that the second part of the article devoted to maximum hours modified the first part and that the third part completely nullified the other two. The clause provides for a 40-hour work week, exempting tool, die and special machine designers and engineers or tool makers, die makers, pressure mold makers and special machinery builders who could work 48 hours, these limitations not applying to "try-out" men or to "individualists."

The minimum wage clause provides for an average minimum prorate of not less than 70c. an hour for skilled labor, no one to receive less than 40c. an hour except apprentices, learners, superannuated or disabled employees whose minimum would be 25c. per hour.

Matthew Smith, representing the Mechanics Educational Society of America, and one of the striking tool and die workers from the Detroit-Pontiac-Flint area, stated that he was an Englishman, had worked at the trade 22 years in England and since 1927 in Detroit. He said that all workers were hired with the understanding that they would work twelve hours per day, seven days per week and that he had worked as much as 133 hours in one week.

Alloy Casting Code Presented

Featured by a late amendment which would make its provisions effective for a period limited to 120 days, the code of fair competition on behalf of the alloy casting industry was submitted by Stanley Tracy, of the Alloy Castings Associations, Inc., an organization claiming to represent all of the well known manufacturers in the industry and more than 80 per cent of its production. The code would establish a maximum work week of 40 hours with minimum wages of 35c. per hour for foundry employees and $14 per week for office and clerical workers.

In a supporting statement, Mr. Tracy asserted that the manufacturing technique and skill required for the industry's production was much more complicated and expensive than that of the cast steel business, and that further peculiar differences in marketing channels and trade practices of the castings group warranted for them a code separate from that of the steel castings industry. This testimony was supported by statements from H. H. Harris, representing the General Alloys Co., Boston, and a representative of the Ohio Steel Foundry Co., Lima, Ohio.

Arthur Notman, of the NRA research and planning staff, questioned the prohibition of increases in present capacity as well as new production by firms which had not been active in the industry for the past three years. A. R. McAllister, replying for the proponents of the code, stated that such prohibition was necessary to protect present investments, as the industry was not now operating at more than 30 per cent of capacity.

Elevator Manufacturers Present Code

The public hearing on the proposed code of fair competition for the elevator manufacturing industry developed serious differences of opinion only on the hour and wage provisions and on the propriety of the manufacturers entering the service field. J. H. Van Alstyne, chairman of the code committee and president of the Otis Elevator Co., formally presented the code and outlined the views of its proponents and conditions in the industry. He also presented several amendments, one of which increased the proposed maximum work week for shop processing labor from 35 to 40 hours. For the most part the other amendments were of a clarifying nature.

William J. Wheeler, representing the National Industrial Service Association, objected to those provisions of the code which would give the elevator manufacturers jurisdiction over the repair and servicing of mechanical and electrical equipment, including elevators. Such activities, he contended, have no place in a manufacturer's code. Accordingly he presented amendments designed to eliminate all such provisions.

Charls Resigns as Steel Institute Secretary

GEORGE H. CHARLS, for the past year secretary and assistant to the president of the American Iron and Steel Institute, New York, has resigned, effective immediately, and has opened an office in the Empire State Building, New York, pending future plans. In announcing his resignation, Mr. Charls said:

> "When I was solicited to accept the invitation of Col. R. P. Lamont, president of the American Iron and Steel Institute, to become a part of that organization, many serious problems confronted the steel industry. I accepted the invitation with the purpose of assisting in the development of a broad program to solve such problems. There was particular appeal in the potential possibilities of market research and trade promotion, of simplification and standardization of products for the steel industry as a whole.
>
> "Subsequent events including the National Industrial Recovery Act have so precluded or minimized the execution of that purpose that I feel that by resigning I will effect a measure of economy for the institute and facilitate its reorganization. For the past two months considerable progress has been made under the code for the steel industry. An organization has been built up to handle details effectively. I now feel that I can withdraw, knowing that the picture is much improved."

Mr. Charls went with the institute soon after the appointment of Col. Robert P. Lamont, as president in October, 1932, and previously had been president of the National Association of Flat-Rolled Steel Manufacturers, with headquarters in Cleveland. Prior to his trade association activity, he had served as president of the old United Alloy Steel Corpn., Canton, Ohio, and had also been vice-president of the American Rolling Mill Co., Middletown, Ohio.

Fabricating Nickel-Clad Thin Material

METHODS for the fabrication of Boker nickel-clad steel sheets, strips and wire have been compiled by H. Boker & Co., 101 Duane Street, New York. The material, which is made by the Fleitmann process and provides for a bonding of the steel with a protecting coating of nickel on one or both sides, was described some time ago in these columns. The Boker company has now prepared an illustrated bulletin which details procedures in cold working and hot work operations and, in a notably complete fashion, describes what practices must be followed in welding. The physical properties of the material and the sizes in which it is obtainable are included in the technical information made available.

Railroad Buying to Be Stimulated By Transportation Loan Division in PWA

WASHINGTON, Nov. 8.—Further effort to stimulate the movement of capital goods through railroad purchases from the steel, metal-working and other heavy industries is seen in the appointment of Frank C. Wright of New York, as chief of the Transportation Loan Division of the Federal Emergency Administration. Though it was known previously that Mr. Wright, who is vice-president of the Bangor & Aroostook Railroad, was to be assigned to this position, official announcement of his selection was not made until today by Public Works Administrator Harold L. Ickes.

Various Government departments for some time have been studying means of lifting the depressed heavy industries from their present depression. It has been generally acknowledged that an underlying cause is the sluggish movement of capital goods. With the absence of a market for long term bonds which ordinarily are the means of financing capital goods, it has been recognized that the alternative lay in Government aid. Special attention has been given to plans to encourage railroad purchases of cars, locomotives, machinery, and other requirements. To this end, Federal Transportation Coordinator Joseph B. Eastman has been particularly active and developed the first major result through plans for the purchase of 1,000,000 tons of steel rails and 200,000 tons of railroad track accessories. Most of this material will be bought through loans from the PWA to the railroads. Following this plan, the Pennsylvania Railroad secured a loan of $84,000,000 from the PWA to complete its electrification project between Wilmington, Del., and Washington.

Car Purchases Possible

The appointment of Mr. Wright immediately after these steps had been taken is therefore more significant. It is a question as to how far the railroads may care to go in the way of borrowing PWA funds or using their own funds at this time for the purchase of equipment, both rolling stock and machine tools. The potential requirements are vast and have been estimated by some sources which have made surveys to run well into the billions of dollars. One estimate is that at least 100,000 freight cars alone are needed by the railroads to replace existing obsolete rolling stock, and with them a large number of locomotives. While it is doubted that the railroads will enter upon a program that will even approach such a volume of purchases, it is the hope of government officials that they may be encouraged to come to the PWA for funds for large scale requirements. There is plainly a hesitancy on the part of the carriers to do so, yet government officials are endeavoring to point to the advantage of such a move. They not only mention the liberal loan terms, which call for no interest payment the first year and a rate of 4 per cent for the remainder of the loan period, to cover the "useful life of the equipment," but to savings they claim would result from the use of modern equipment.

Mr. Eastman in surveys he has undertaken and is conducting as head of the purchases section has emphasized the idea of economy in railroad purchases of modern equipment which is actually needed. He is collaborating with the American Railway Association and other organizations in making the surveys. The field covers plans for coordination of railroads, standardization and simplification of equipment and supplies, means of reducing costs of production, storing, handling and distribution. Other plans contemplate such matters as central technical or engineering organization to serve all of the carriers of the country.

The setting up of the Transportation Loan Division of the PWA in view of plans that have been made, some completed and broader ones ahead will spur greater activity towards a large capital goods movement. There is no assurance that expectations will be fully realized but confidence is expressed that a great deal will be accomplished. The Transportation Loan Division will advise the Public Works Administrator in the exercise of the clause of the Public Works act which empowers the administration to "Aid in the financing of such railroad maintenance and equipment as may be approved by the Interstate Commerce Commission as desirable for the improvement of transportation facilities."

Public Works Administrator Ickes points out that it is the policy of the PWA to aid railroads and heavy industries within its power as demonstrated last week in allotments to the Pennsylvania Railroad and for the purchase of steel for the railroads. This policy, it is pointed out, is carried out in consultation with the transportation coordinator.

Detroit Tool and Die Strike is Settled

DETROIT, Nov. 7.—The strike of tool and die makers, which started late in September in Flint and spread to Detroit and Pontiac, was brought to an end in both independent shops and automobile plants when the strikers the past few days relinquished most of their demands. Settlements already made affect Fisher Body Corpn., Hudson Motor Car Co., Packard Motor Car Co. and 47 tool and die companies. The formal end of the strike in the remaining dozen plants is expected in the form of agreements to be announced in the next few days.

Although the terms of agreements vary with individual plants, the strikers secured little of what they set out to get when they laid down their tools. In the case of some independent shops it is known that the men were granted a minimum wage of 85c. an hour, representing an increase of 5c. from the previous scale, and a 40-hr. week. If longer hours are worked, the overtime schedule must be approved by a shop committee representing the employees.

At the Fisher Body Corpn. the rate agreed on is the same as that which previously prevailed. This is said by Edward F. Fisher, vice-president, to be higher than that in independent shops where a settlement has been reached. Mr. Fisher stated that "the strike committee came to our tool division managers and told them they wanted to call off the strike. They asked what men and how many we wanted back. The first men returned today and by the end of the week there will be between 125 and 150 back, or all we need. We told them we would take the men back at the same rates and on the same status as before. The decision was voluntary on their part and we made no agreement recognizing their union."

At Flint the strike committee of the Mechanics Educational Society has announced the end of the strike. Arnold Lenz, manager of the Chevrolet Motor Co. at Flint, refused to meet with the committee, reiterating his recent statement that any men who wanted to go to the employment office and apply for jobs would be taken back if jobs were open.

Original Demands Not Met

When the members of the Mechanics' Educational Society struck, they did not formulate any demands for five days, walking out of the various shops merely because their leaders ordered them out. When demands finally were drawn up, they called for (1) a wage increase of 25 per cent, with a minimum of $1 an hour for benchmen and 90c. for affiliated machinists;

(2) consent of a shop committee before any shop could operate in excess of 40 hr. a week; and (3) no penalizing of workers who struck.

Until last week strikers had held out for a settlement in all plants before returning to work at any of them. This position was abandoned after several plants had signed agreements and workers wanted to return to their jobs.

Automobile companies were less affected than independent shops throughout the strike. They were adamant in their opposition to granting the demands of the men, which they considered unreasonable. They met with the strike committee on several occasions, thus fulfilling the collective bargaining provision of the Recovery Act, but rejected the committee's proposals.

Throughout the strike it was evident that neither William Collins, head of the American Federation of Labor at Detroit, nor Frank X. Martel, president of the Detroit Federation of Labor, lent financial or moral aid to the Mechanics' Educational Society, which purports to be a craft guild and has no affiliation with the federation. Significant of the ill feeling between the two labor groups was the protest recently made by the strikers that labor's representatives on the Detroit Regional Labor Board, which played a considerable part in settling the strike, were all members of the American Federation of Labor and therefore the board did not have a properly rounded representation of labor. As a result of this protest Mr. Martel temporarily withdrew from the board in favor of a member of the Mechanics' Educational Society.

Pennsylvania Opens Bids for Highway Work

IN accordance with advertisements, the Pennsylvania Department of Highways opened bids on Oct. 27 covering miscellaneous reinforced highways, pavements, and structures in Cumberland, Bucks, Fayette, Westmoreland, Warren, Adams, Somerset, Cambria, and Bradford counties. The low bids aggregated approximately $422,000.

On Nov. 2 additional bids were opened pertaining to repairing and new construction in Philadelphia, Carbon, Armstrong, Monroe, Indiana and Jefferson Counties. The low bids for this work totalled over $456,000.

Pittsburgh Screw & Bolt Corpn. reports net profit for the third quarter of $110,691, compared with net loss of $90,062 in the second quarter and loss of $203,925 in the first quarter. For nine months ended Sept. 30, net loss totaled $183,297, against loss of $621,727 in the same period last year.

Art Metal Construction Co. Strike Settled by National Labor Board

WASHINGTON, Nov. 8—More than 200,000 wage earners have returned to work as a result of operations of the National Labor Board, according to Senator Robert F. Wagner, chairman. The board has taken jurisdiction over 110 cases, with disputes over recognition of employees' representatives and over collective bargaining having caused more than two-thirds of them.

Of particular interest to the metal working industry was the recent settlement of a strike in the plants of the Art Metal Construction Co., Jamestown, N. Y., which has been in progress since June 21. The board's decision regarding this strike was as follows:

> The company shall make every effort to absorb all the striking employees who reside in Jamestown and who have no other employment. Until all such strikers have been absorbed, it shall not give employment to any worker who was not in its employ during at least part of the period from Dec. 1, 1932, to June 20, 1933. For every worker engaged who was not on the payroll of June 20, 1933, it shall employ at least one of the striking workmen. If by April 1, 1934, it is unable to absorb all of its former employees, it shall, so far as practicable, divide the available work among those of its former employees who reside in Jamestown, are unemployed, and desire employment from the company. The company may employ artisans of special skill for any work which cannot be satisfactorily formed by the striking workmen. There shall be no discrimination against any worker by reason of his affiliation with any organization or his participation in the strike. All matters relating to wages, hours of employment and working conditions shall be the subject of collective bargaining between the company and the representatives of the workers. All the employees on the June 20 payroll shall have a voice in the selection of such representatives. Any further disputes between the parties shall be submitted to this Board for decision.

Regional Boards Named

Appointment of regional labor boards in Pittsburgh, Buffalo and Indianapolis has also been announced by Senator Wagner. They are as follows:

PITTSBURGH

Impartial chairman: Dr. Thomas S. Baker, president, Carnegie Institute of Technology.

FOR INDUSTRY

George A. Blackmore, president, Westinghouse Air Brake Co.
George T. Ladd, president, United Engineering & Foundry Co.
Thomas A. Dunn, president, Consolidated Ice Co.
Arthur C. Kaufmann, president, McCreery & Co.
Frank J. Lanahan, president, Fort Pitt Malleable Iron Co.

FOR LABOR

J. J. Kane, printing pressmen.
John Hoehn.
P. J. McGrath, secretary, Central Labor Union.
P. J. Fagen.
Louis Leonard, secretary, Amalgamated Iron, Steel & Tin Workers.

BUFFALO

Impartial chairman: Dr. Rudolph Eichorn, president of Canisius College.

FOR INDUSTRY

Keith Williams, vice-president, Pratt & Letchworth Co.
J. C. Hawley, president, Spring Porch Co.
B. Emmett Finacune, Rochester, N. Y.
Henry W. Wendt, Jr., chairman, Buffalo Forge Co.
Nisbet Grammer, Buffalo.

FOR LABOR

William P. Fisher, business representative, Electrical Workers Union.
Norbert Berger, business representative, pressmen's union.
Clarence S. Conroy, vice-president, New York State Federation of Labor.
Edward Friedrich, business representative, brewers' union.
John C. Johnston, secretary, Central Labor Council.

INDIANAPOLIS

Impartial chairman: Dr. Stanley Coulter, formerly of Purdue University.

FOR INDUSTRY

Howard T. Griffith, president, Udell Works.
Hugh J. Baker, president, Hugh J. Baker & Co.
John Rau, Jr., president, Fairmont Glass Works.
John Keughan, president, Keughan & Co.
G. M. Williams, former president, Marmon Motor Car Co.

FOR LABOR

Robert C. Fox, president, Central Labor Union.
Alex Gorden, Railway Brotherhood.
Chas. Lutz, president, Building Trades Council.
Alden Hattery, Allied Printing Trades.
Rose Schaffner, United Garment Workers.

Reynolds Metals Co., Inc., 65 Broadway, New York, has acquired the manufacturing rights and the special automatic machinery needed to produce a paper-backed metal lath building fabric developed and extensively sold by the E. D. Coddington Mfg. Co., 5024 North 37th Street, Milwaukee. The Reynolds company has perfected an aluminum foil insulation for structures and will use it in conjunction with the Coddington material, known as Ecod. The Milwaukee firm will build a number of additional machines and for the time being will continue manufacturing the new product, as well as acting as distributing agent for the Reynolds company and sales representative for the Milwaukee territory. It will also continue manufacture of its other building material lines, including gypsum, cement paints, colored plasters, etc.

... PERSONALS ...

HAROLD T. YOUNGREN has been appointed chief engineer of the Olds Motor Division of General Motors Corpn. For the last four years he has been assistant chief engineer of the Buick Motor Co. From 1910 to 1917 he was a member of the engineering staff of several companies, including the Allis-Chalmers Mfg. Co. and the Westinghouse Electric & Mfg. Co. After the war he became associated with the Pierce-Arrow Motor Car Co. as chassis and motor designer and later was put in charge of passenger car chassis design. In 1927 he joined the Studebaker Corpn. as consulting engineer and a year later was made executive engineer in charge of passenger car chassis design. The following year he went to Buick.

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HUGH L. RUSCH, formerly supervisor of the technical data section and of the performance report section of the Johns-Manville Corpn., has been elected vice-president and eastern sales manager, with offices in the Chrysler Building, New York, for the Northern Pump Co., Minneapolis. He has been identified with the company for over a year.

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HARVEY D. STALNAKER, formerly president of the Stalnaker Steel Co., Pittsburgh, has been made Pittsburgh resident manager of the Joseph Schonthal Co., Columbus, Ohio.

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PERCY W. FENNER, for a number of years Cleveland district agent for the Latrobe Electric Steel Co., has been made representative of the Firth-Sterling Steel Co. in Cleveland.

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E. AKRIDGE, who has been identified for the past five years with Foote Brothers Gear & Machine Co., Chicago, has been added to the sales staff of the Chicago office. GEORGE E. POPELAR, formerly with the Hildebrand Engineering Co. and Industrial Engineering Co., has also been appointed sales engineer.

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M. B. BARBE, who has had considerable experience in the sales and engineering branches of the anti-friction bearings industry, has been made district representative for the Bantam Ball Bearing Co. for northern Ohio, with headquarters in Warren.

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HUGH DEAN has been made general manufacturing manager of the Chevrolet Motor Co., with headquarters in the central office at Detroit. He succeeds to the position vacated recently when FLOYD O. TANNER was named to the staff of W. S. KNUDSEN, executive vice-president of General Motors Corpn. Mr. Dean formerly had charge of Detroit and Toledo manufacturing operations of the Chevrolet company under Mr. Tanner. He will direct all Chevrolet manufacturing activities, while W. C. WILLIAMS, JR., will retain supervision over all assembly plant operations.

H. T. YOUNGREN

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JAMES P. BARTON has been appointed sales engineer of the electrical sheet division of the Empire Sheet & Tin Plate Co., Mansfield, Ohio. Mr. Barton has had long experience in the silicon sheet requirements of the electrical industry. He was formerly connected with the radio engineering department of the Westinghouse Electric & Mfg. Co., at East Pittsburgh, Pa., and Springfield, Mass., the engineering department of the General Motors Corpn., at Dayton, Ohio, and with the Phelps Dodge Copper Products Corpn., Inca Mfg. Division, at Fort Wayne, Ind. He is a member of the American Institute of Electrical Engineers, the Institute of Radio Engineers and the American Society for Testing Materials and is the author of several papers that have appeared in journals of the American Institute of Electrical Engineers.

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LOYAL T. IVES, formerly of the editorial staff of THE IRON AGE and previous to that a member of the publicity department of the Worthington Pump & Machinery Corpn., Harrison, N. J., has been appointed treasurer and shop manager of the Steiner Oven Co., Bloomfield, N. J. The Steiner company, of which F. H. DAVIS is president, builds all types of industrial ovens, dryers and heating equipment, including core ovens, enamel baking ovens, glass lehrs, immersion heating tanks and heat-treating furnaces. Mr. Ives is a graduate both of Princeton University and of the Stevens Institute of Technology.

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ARTHUR P. VAN SCHAICK, vice-president in charge of sales, American Chain Co., has been elected president of the American Hardware Manufacturers Association.

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C. J. WHIPPLE, president, Hibbard, Spencer, Bartlett & Co., Chicago, has been reelected president of the National Wholesale Hardware Association.

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FREDERICK LAIST, vice-president of the Anaconda Copper Mining Co., has been elected president of the Copper and Brass Research Association. Vice-presidents elected at the annual meeting on Oct. 19 were: F. S. CHASE, president, Revere Copper & Brass, Inc.; H. DONN KERESEY, president, Anaconda Wire & Cable Co., and LOUIS S. CATES, president, Phelps Dodge Corpn.

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WILLIAM D. BLISS, professor of industrial relations and chemical engineering, Marquette University, Milwaukee, has been elected president of the Engineers' Society of Milwaukee. He is a graduate both of the Marquette and the University of Wisconsin colleges of engineering and has been a member of the Marquette faculty since 1914.

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EDWARD B. WINNING has been made manager of northern coal mines of the Republic Steel Corpn., Youngstown, succeeding GEORGE H. MORSE, who has become vice-president and general manager of the Union Collieries Co. Mr. Winning will make his headquarters in the Fayette Title & Trust Building, Uniontown, Pa.

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HOWARD MCCLELLAND, for the past 20 years connected with the open-hearth department of Republic Steel Corpn., has joined the sales organization of Basic Dolomite, Inc., as service engineer. His headquarters will be at the general offices of the company at 845 Hanna Building, Cleveland.

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MORRIS LLEWELLYN COOKE, Philadelphia consulting and management engineer, has been named chairman of the Mississippi Valley committee of the Public Works Administration, Washington. Mr. Cooke brings to the PWA a large experience in many different lines of activity. He was director of the Department of Public Works of Philadelphia from 1911 to

1915, was chairman of the storage section of the War Industries Board and executive assistant to the chairman of the United States Shipping Board in 1918.

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G. C. LLOYD has resigned from the position of secretary of the (British) Iron and Steel Institute which he has occupied for more than 25 years. He has accepted the position of honorary secretary and is maintaining his close association with the institute in an advisory capacity. K. HEADLAM MORLEY succeeds Mr. Lloyd as secretary.

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C. H. HENKEL has been chosen president of the recently organized Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, which took over five plants of the Empire Steel Corpn., Mansfield. Mr. Henkel has been receiver of the latter company.

Cast Iron Pipe

Townsend, Mass., has awarded 58,000 ft. of 6 to 12-in. to Warren Pipe & Foundry Co.

Quincy, Mass., has purchased 170 tons from Donaldson Iron Co.

Kew Gardens, N. Y., has placed 150 tons of 16 and 24-in. for Interborough Parkway, with Warren Pipe & Foundry Corpn.

Wilmington, Del., plans water pipe line along Northeast Boulevard. Cost about $15,000.

Selby, Ohio, plans pipe line system for new water supply project. Cost $325,000, with waterworks station and auxiliaries. R. Russelman, Hippodrome Building, Cleveland, is engineer.

Algood, Tenn., plans pipe line system for water supply. Cost $30,000. Financing is being arranged.

Chicago is inquiring for 400 tons 16 to 48-in. special fittings.

Beresford, S. D., plans 6-in. line for water supply system. Cost $35,000, with pumping station. J. W. Emberg, Madison, S. D., is consulting engineer.

Missouri Water Co., Grandview, Mo., plans pipe line to connect with trunk system at Kansas City, Mo. Cost about $200,000. Financing is being arranged. C. A. Haskins & Co., Finance Building, Kansas City, are engineers.

Freedom, Okla., plans water pipe lins system. Cost about $20,000. Financing is being arranged. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

Whittier, Cal., plans 10 and 6-in lines for water service at Rideout Heights and North Whittier, including pumping stations. Cost $35,429.

North Sacramento, Cal., plans 63,900 ft. of 4 to 12-in. for new water distribution system. Cost $102,000, with pumping plant, elevated steel tank and auxiliary structures. Financing is being arranged. C. L. Knight is city engineer.

Los Angeles has awarded 3585 tons as follows: 1650 tons to National Cast Iron Pipe Co., 460 tons to Pacific States Cast Iron Pipe Co., 700 tons to American Cast Iron Pipe Co., and 775 tons to R. D. Wood.

Beverly Hills, Cal., has awarded 110 tons to American Cast Iron Pipe Co.

Hamilton Field, Cal., has awarded 250 tons to National Cast Iron Pipe Co.

Long Beach, Cal., has awarded 1600 tons to United States Pipe & Foundry Co.

Fort Lewis, Wash., has awarded 7000 ft. to Central Foundry Co.

Puget Sound, Wash., has awarded 325 tons to United States Pipe & Foundry Co.

OBITUARY

CHARLES E. ADAMS, for years president of the Cleveland Hardware Co., Cleveland, and chairman of the board of directors of its successor, the Cleveland Hardware & Forging Co., since the reorganization two years ago, died Nov. 4, aged 74 years. He was born in Cleveland and starting with the Cleveland Hardware Co. when a young man as a corresponding secretary he won promotions that finally placed him at the head of the company. A civic leader and philanthropist, Mr. Adams had served as general chairman of the Cleveland Community Fund since it was founded in 1919. In recognition of his long public services two years ago he was made honorary president for life of the Young Men's Christian Association of Cleveland, of which he was also a trustee. He had served as president of the Cleveland Chamber of Commerce, Union, Mayfield and Midday Clubs. He was a director of the Cleveland Trust Co. and of the Cleveland Tractor Co.

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JULIUS J. GOETZ, founder and president, Western Metal Specialty Co., Milwaukee, died Oct. 30, aged 65 years. He was born in Germany and came to America in early youth, establishing his concern in 1910.

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ADOLPH J. SCHEID, manager, Milwaukee branch, Columbia Tool Steel Co., since its establishment in 1900, died Oct. 29, aged 71 years. He was one of the founders and treasurer of the Columbia company. One son, Adolph J. Scheid, Jr., is identified with the works at Chicago Heights, Ill., and two sons, Robert B. and Carl F. Scheid, have been associated with their father in managing the Milwaukee branch.

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J. H. GIBBONEY, chief chemist of the Norfolk & Western Railroad, died in Roanoke, Va., on Oct. 30, aged 54 years. Mr. Gibboney was president of the American Society for Testing Materials in 1926-1927. He had been an officer of A.S.T.M. Committee A-5 on Corrosion of Iron and Steel since 1914, and chairman from 1922 to the time of his death.

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WILLIAM T. ELKINTON, chairman of the board of the Philadelphia Quartz Co., Philadelphia, died on Oct. 25, aged 73 years. He was the third generation of his family in the business which celebrated its centenary in 1931.

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GEORGE W. ROWELL, SR., pioneer Wisconsin industrialist, died Nov. 1 at Milwaukee, aged nearly 91 years. He was born in Washington County, Wis., April 13, 1843, and with his brother, Ira, organized I. B. Rowell & Co. in 1870, to manufacture farm implements. The concern is credited with the distinction of manufacturing the first steel plow in Wisconsin. The Rowell business originally was established at Menomonee Falls, Wis., but later was transferred to Waukesha, Wis. Mr. Rowell retired in 1913.

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EDWARD STILSON, who was identified with Wickwire Brothers, Cortland, N. Y., for nearly 50 years, died at his home at that city on Oct. 21, aged 66 years.

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RALPH WATSON CADMAN, president, A. D. Cadman Mfg. Co., Pittsburgh, died on Oct. 14, aged 56 years. He was born at Edgewood, Pa., in 1877, and had been president of the company since the death of his father.

Railroad Equipment

Hillsboro & Northeastern has bought one 35-ton Plymouth gasoline locomotive from Fate-Root-Heath Co.

War Department, United States Engineers, New Orleans, has purchased four asphalt cars from Atlas Car & Mfg. Co.

E. I. du Pont de Nemours & Co. have bought 10 insulated tank cars from General American Transportation Corpn.

New York Central is inquiring for three gas-electric baggage and mail rail motor cars.

Denver & Rio Grande Western is inquiring for prices on conversion of three coaches to chair cars.

Great Northern will repair 500 cars in its own shops.

Blast Furnace Group to Meet in Pittsburgh

THE Eastern States Blast Furnace and Coke Oven Association will hold its annual fall meeting at the William Penn Hotel, Pittsburgh, on Friday afternoon, Nov. 17. Following a luncheon at 12:00 o'clock, individual round table discussions will be held by the blast furnace and coke oven divisions. Preparation of merchant iron, and carbon in pig iron with particular relation to ingot mold practice will be discussed by the furnace group, while those of the coke oven group will talk about the rehabilitation of cold by-products coke ovens. In a joint meeting of both divisions at 3:30 o'clock, the latest developments in the preparation and use of mixed blast furnace and coke oven gases is scheduled for discussion. An informal dinner is scheduled for 6:30. H. F. Shilling is chairman of the committee on arrangements.

Shipments from Lake Erie docks in October were 2,349,415 tons as compared with 461,655 tons during the same month last year. The dock balance Nov. 1 was 5,301,505 tons as against 5,223,086 tons on the same date last year.

Milwaukee Road Asks For Loan To Buy Rails

WASHINGTON, Nov. 8.—Formal application has been made to the Interstate Commerce Commission by the Chicago, Milwaukee, St. Paul & Pacific Railroad for a public works loan to purchase 50,000 tons of steel rails. This is the first application made by a railroad for a loan for rail purchases. The Milwaukee asked for authority to give a promissory note of $1,818,750 for the purchase of the rails at the emergency price of $36.37½ per ton agreed upon by President Roosevelt and rail makers.

The Milwaukee application announced the intention of the carrier to file another application for public works funds to purchase rail fastenings. The application says that it will ask for funds for the purchase of about 19,000 tons of rail fastenings, which at present quotations would cost $948,514. The carrier stated that it is now in need of 50,000 tons of steel rails and pointed out that over the period from 1923 to 1929 it had laid an annual average of 51,061 tons on its main line trackage of 11,716 miles. Under the terms of the Public Works Act, the Milwaukee will be granted the loan without interest charge the first year. It asked for a loan for 10 years. The rate of interest after the first year will be 4 per cent.

Work Resumed At Captive Mines

PLACATED by the pledge of President Roosevelt that their interests would be protected by the NRA collective bargaining provisions, captive mine workers in Western Pennsylvania have started an orderly march back to the pits. Many operators in the district, including Thomas Moses, president, H. C. Frick Coke Co., have indicated that they hope to reinstate all workers who had been employed at the outset of the captive mine "holiday." In line with the truce declared at Washington last week between operators and miners, no discrimination is being shown in the acceptance of former employees at the mines. Martin F. Ryan, insurgent chief of the striking contingent, returned early this week to his former post as checkweighman at the Frick company Colonial No. 4 mine. Fayette County, Pa., center of the three-month strife, has witnessed a practically complete restoration of peace with the withdrawal of State police, who had been stationed there by Governor Pinchot. A number of representatives of the National Labor Board, headed by its vice-chairman, Jesse L. Miller, and its secretary, Dr. William M. Leiserson, have arrived in the coal regions for the purpose of supervising the coming collective bargaining elections by the captive mine workers. These elections, on which hinges the final outcome of the differences between operators and miners, are slated to be held in the next fortnight. Only those miners who were on payrolls at the date of the beginning of the "holiday" will be eligible to vote.

Plans Volume Output Of Small Airplanes

WASHINGTON, Nov. 8.—Plans were launched today by Eugene L. Vidal, director of aeronautics, Department of Commerce, which have for their goal a minimum production by the American aircraft industry of 10,000 small planes by next spring. The proposed volume would enable makers to sell a plane at $700 or less. The craft would be small two-passenger monoplanes, constructed of a new steel alloy, fitted with an eight-cylinder, small-bore engine.

In instituting the plan, Mr. Vidal is addressing a memorandum to all Department of Commerce licensed pilots, student pilots, and mechanics of active status, a total of nearly 34,000 persons, outlining briefly the specifications for a volume production airplane and calling for a definite statement as to whether they would purchase such a plane if it is made available in the near future. They are also requested to tell the Department how many persons or groups among their acquaintances would be purchasers. The result of the survey will be made available to the American aircraft industry.

Higher Switching Rates In Chicago Area Upheld

CHICAGO shippers lost their fight to keep the railroads from raising intrastate switching rates in Indiana and Illinois when the Federal Court upheld the validity of the order of the Interstate Commerce Commission entered on July 3. The higher rates are scheduled to go into effect Nov. 20, but shippers are attempting to have this date postponed pending an attempt to carry the fight to the Supreme Court. Chicago district interests take the position that the Interstate Commerce Commission did not have sufficient and proper evidence on which to base its order and assume jurisdiction over State rates. Shippers estimate that the higher rates will cost them from $1,000,000 to $5,000,000 annually. The increases ordered by the commission raise one-line hauls 0.5c. to 3c. a 100 lb., two-line hauls 1c. to 3.5c. and three or more line haul rates 1c. to 4c.

Reinforcing Steel

Awards 5300 Tons—New Projects 13,500 Tons

Medford, Mass., 116 tons, State bridge, to Joseph T. Ryerson & Son, Inc.

New York, 700 tons, Manhattan West Side Elevated Highway; Poirier McLane Corpn., N. Y., low bidder.

Long Island, N. Y., 100 tons, road mesh for Mitchel Field, to American Steel & Wire Co.

Long Island, 350 tons, road mesh for Jones Beach Parkway, to American Steel & Wire Co.

Long Island, 100 tons, highway grade crossing, to Truscon Steel Co.

Oneida County, N. Y., 175 tons, mesh, to American Steel & Wire Co.

Elmira, N. Y., 1300 tons, bridges and approaches for Erie Railroad; divided between Truscon Steel Co. and Jones & Laughlin Steel Corpn.

Broome County, N. Y., 300 tons, road mesh, to Kalman Steel Corpn.

Buffalo, 200 tons, Buffalo breakwater bulkhead, to Kalman Steel Corpn.

Somers Point, N. J., 100 tons, State bridge, to Kalman Steel Corpn.

Cook and Du Page Counties, Ill., 100 tons, road work, to unnamed bidders.

Cleveland, 800 tons, Easterly sewage disposal plant, to Concrete Steel Co.

St. Louis, 203 tons, city solarium, St. Joseph's Institute for Deaf and coal storage station for city waterworks, to Laclede Steel Co.

Denver, 195 tons, Bureau of Reclamation Specification No. 3321-A and 3316-B, to an unnamed bidder.

Hamilton Field, Cal., 550 tons, three barracks buildings, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

Bourne, Mass., 1500 tons, Government canal bridge.

Sagamore, Mass., 1500 tons, Government canal bridge.

Buzzards Bay, Mass., 1500 tons, Government railroad bridge.

Philadelphia, 850 tons, Philadelphia Navy Yard; bids Dec. 14.

Syracuse, N. Y., 1000 tons, grade separation program for New York Central Railroad; bids Dec. 4.

Albany, N. Y., unstated tonnage, New York Central track elimination; plans out.

East Aurora, N. Y., 190 tons, Pennsylvania Railroad grade crossing elimination.

State of Ohio, 160 tons, bridges; bids Nov. 10.

State of Ohio, 813 tons, highway bridges, culverts and road construction.

Chicago, 200 tons, housing plan, to be carried through by public expenditure.

Lyons, Ill., 180 tons, highway bridge.

State of Missouri, 685 tons, highway projects; bids opened Oct. 28.

State of California, 150 tons, highway work in eight counties; bids Nov. 22.

State of Oregon, 123 tons, highway work in five counties; bids Nov. 15

Island of Kauai, T. H., 275 tons, Federal road.

Honolulu, 270 tons, reservoir on Diamond Head; bids under advisement.

Pearl Harbor, T. H., 4100 tons additional, pier and quay walls; bids Nov. 15.

Completion of Old Pig Iron Contracts Permitted—Other Resolutions Approved

COMPLETION of old pig iron contracts prior to Dec. 31, 1933, and allowance of the same differentials to certain users of tubular goods as are now offered to jobbers are made possible by commercial resolutions 27 and 28, adopted by the directors of the American Iron and Steel Institute on Oct. 27 and made effective Nov. 3.

An earlier resolution provided for fixed deductions from the base prices of tubular products in sales to jobbers and No. 27 permits similar allowances to be made in the case of standard steel pipe, waterwell casing, rigid electrical conduit pipe and large O. D. pipe to be used for the manufacture of pipe nipples, fire protection sprinkler systems, ice machines, refrigerator systems and rigid conduit and to any fabricator of power piping.

Pig Iron Contracts May Be Completed

Because certain sellers of pig iron had taken contracts covering longer periods than three months and that, in many cases, these contracts had not been fully taken out on Sept. 30, producers are permitted by resolution No. 28 to allow users until Dec. 31 to complete such contracts. However, sellers are required to file such contracts with the Institute by Nov. 15, showing the amount of iron left to be shipped at time of filing.

Sales for Re-export Limited

Allowances on sales of steel products for indirect export are limited by amendment to commercial resolution No. 6. Such deductions may now be made only on plates, shapes and bars for fabrication for an identified structure outside of the United States but in North America and on tin plate for use by purchasers in manufacture of articles for export trade. The original resolution permitted allowances on sheets for manufacture of steel drums and culverts for export and on rolled steel car wheels and axles.

Truck Deliveries Confined to Carloads

Sales of steel products for delivery by truck on which an allowance of 65 per cent of the all-rail-freight rate may be made are confined to carload quantities or must be deemed as such, according to an amendment to commercial resolution No. 8. It is also stipulated that delivery shall be completed not later than during the next working day after delivery begins.

October Drop in Steel Ingot Output Less Sharp Than in Prior Months

OCTOBER production of Bessemer and open-hearth steel ingots declined only 8.6 per cent under the September rate, following a 20.3 per cent reduction from August to September, according to the American Iron and Steel Institute. October output totaled 2,111,842 gross tons, or 81,225 tons daily, compared with 2,310,982 tons, or 88,884 tons daily in the preceding month. During October, the industry's capacity was engaged at 37.37 per cent, as compared with 40.89 per cent in September and 19.33 per cent in October, 1932.

In the 10 months ended with October, production amounted to 19,516,842 tons, as against 11,429,578 tons in the corresponding 1932 period.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Gross Tons)
Reported for 1933 by Companies Which Made 96.57 Per Cent of 1932 Ingot Output

1933	Open-Hearth	Bessemer	Calculated Output All Companies: Monthly	Calculated Output All Companies: Daily	No. of Working Days	Per Cent Operation
January	885,743	109,000	1,030,075	39,618	26	18.23
February	922,806	126,781	1,086,867	45,286	24	20.83
March	784,168	94,509	909,886	33,699	27	15.50
April	1,180,893	135,217	1,362,856	54,514	25	25.08
May	1,716,482	216,841	2,001,991	74,148	27	34.11
June	2,211,657	296,765	2,597,517	99,904	26	45.96
July	2,738,083	355,836	3,203,810	128,152	25	58.95
August	2,430,750	370,370	2,900,611	107,430	27	49.42
September	1,991,242	240,473	2,310,982	88,884	26	40.89
October	1,847,773	191,673	2,111,842	81,225	26	37.37
Ten months	16,709,557	2,137,465	19,516,437	75,353	259	34.66

The figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1932, of 67,386,130 gross tons for Bessemer and open-hearth steel ingots.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Gross Tons)
Reported for 1932 by Companies Which Made 93.71 Per Cent of 1931 Ingot Output

1932	Open-Hearth	Bessemer	Calculated Output All Companies: Monthly	Calculated Output All Companies: Daily	No. of Working Days	Per Cent Operation
January	1,230,907	160,633	1,484,991	57,115	26	26.41
February	1,230,970	157,067	1,481,253	59,250	25	27.40
March	1,149,193	193,944	1,433,337	53,087	27	24.55
April	1,036,163	144,197	1,259,629	48,447	26	22.40
May	950,838	103,593	1,125,243	43,279	26	20.01
June	755,068	100,249	912,757	35,106	26	16.23
July	653,039	102,916	806,722	32,269	25	14.92
August	696,122	97,323	846,730	31,360	27	14.50
September	804,470	124,970	991,858	38,148	26	17.64
October	885,773	132,876	1,087,058	41,810	26	19.33
November	838,419	128,844	1,032,221	39,701	26	18.36
December	724,917	81,932	861,034	33,117	26	15.31
Total	10,955,879	1,528,544	13,322,833	42,701	312	19.75

The figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1931, of 67,473,630 gross tons for Bessemer and open-hearth steel ingots.

Questionnaire to Railroad Executives

FEDERAL Transportation Coordinator Joseph B. Eastman on Nov. 8 addressed letters to executives of Class 1 railroads asking them to state their needs with respect to the retirement, replacement or modernization of their motive power. The survey is being made through questionnaire and is a continuation of the policy of the Government to stimulate a large-scale capital goods movement by railroad purchases. Such as is made will be through loans from the Public Works Administrator. The survey regarding the locomotive repair and retirement program calls for detailed description of locomotives, separated by class, age and tractive power, with figures for each series showing original cost and accrued depreciation. In the case of locomotives scheduled for retirement, additional information covering the net salvage value and the retirement charge is required.

The questionnaire also inquires into the character and condition of so-called "stored serviceable" locomotives, upon which the carriers rely as a reserve to take care of any substantial increase in traffic. A combination of statements as to locomotives ready for retirement, stored and in need of repairs will be used to show the potential capacity of motive power and replacement needs. The railroad executives also are requested to submit information as to the merits of economic values of any certain types of locomotives. Replies are requested at the earliest possible date.

Revised Pig Iron Production Figures for October

PRODUCTION of coke pig iron in October totaled 1,356,361 gross tons, compared with 1,522,257 tons in September. Output per day in October, at 43,754 tons, dropped 13.7 per cent from the September daily rate of 50,742 tons.

There were 78 furnaces in blast on Nov. 1, making iron at the rate of 39,585 tons a day, compared with 89 active stacks on Oct. 1 with a daily operating rate of 48,215 tons. Fifteen furnaces were blown out or banked in October, while four were lighted. The Steel Corporation showed a net loss of seven furnaces, other steel companies a loss of three furnaces, and merchant furnaces a loss of one.

Among the furnaces blown out or banked are the following: One Carrie, two Duquesne, one Ohio, one Mingo and one Farrell furnace of the Carnegie Steel Co.; one Monongahela furnace, of the National Tube Co.; one Gary, Illinois Steel Co.; one Monessen, Pittsburgh Steel Co.; one Cambria, Bethlehem Steel Co.; a Campbell and a Hubbard furnace of the Youngstown Sheet & Tube Co.; one Betty, Republic Steel Corpn.; one Shenango, Shenango Furnace Co. and one Woodward Iron Co. furnace.

Furnaces blown in include: a Susquehanna unit and two Weirton furnaces, of the National Steel Corpn.; one Lorain furnace of the National Tube Co.

Daily Average Production of Coke Pig Iron

Gross Tons

	1933	1932	1931
January	18,348	31,380	55,299
February	19,798	33,251	60,950
March	17,484	31,201	65,556
April	20,787	28,430	67,317
May	28,621	25,276	64,325
June	42,166	20,935	54,621
½ year	24,536	28,412	61,356
July	57,821	18,461	47,201
August	59,142	17,115	41,308
September	50,742	19,753	38,964
October	43,754	20,800	37,848
November	.....	21,042	36,782
December	.....	17,615	31,625
Year	....	23,733	50,069

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1933	1932	1933	1932
January	568,785	972,784	8,810	11,250
February	554,330	964,280	8,591	4,010
March	542,011	967,235	4,783	4,900
April	623,618	852,897	5,857	481
May	887,252	783,554	5,948	5,219
June	1,265,007	628,064	13,074	7,702
½ year	4,441,003	5,168,814	47,063	33,562
July	1,792,452	572,296	18,661	2,299
August	1,833,394	530,576	16,953	3,414
September	1,522,257	592,589	13,339	2,212
October	1,356,361	644,808	16,943	2,302
November	.....	631,280	....	5,746
December	.....	546,080	....	7,807
Year	.....	8,686,443	....	57,342

*These totals do not include charcoal pig iron. The 1932 production of this iron was 15,055 gross tons.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

1933	*Tons*	1932	*Tons*
January	2,602	January	6,256
February	2,863	February	7,251
March	2,412	March	7,157
April	1,908	April	5,287
May	3,129	May	4,658
June	4,088	June	6,090
July	6,783	July	3,329
August	7,756	August	3,070
September	10,034	September	3,213
October	8,634	October	4,286
November	....	November	4,435
December	....	December	3,674

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons) October (31 Days)	Production (Gross Tons) September (30 Days)	November 1 Number in Blast	November 1 Operating Rate, Tons a Day	October 1 Number in Blast	October 1 Operating Rate, Tons a Day
New York:						
Buffalo	84,520	82,450	7	2,920	6	2,750
Other New York and Mass.	13,676	19,201	2	440	2	640
Pennsylvania:						
Lehigh Valley	26,248	27,053	2	845	2	820
Schuylkill Valley	22,278	13,354	2	720	2	570
Susquehanna and Lebanon Valleys	....	....	0	....	0	....
Ferromanganese	2,594	2,614	1	85	1	85
Pittsburgh District	277,516	336,892	11	7,005	16	10,890
Ferro. and Spiegel	9,144	19,524	2	295	2	605
Shenango Valley	30,779	44,439	1	420	3	1,480
Western Pennsylvania	18,292	40,577	2	590	3	1,350
Ferro and Spiegel	9,652	5,444	1	310	1	180
Maryland	48,384	73,883	3	1,560	3	1,895
Wheeling District	85,723	108,803	5	2,980	4	2,550
Ohio:						
Mahoning Valley	146,846	161,037	5	3,340	8	4,985
Central and Northern	150,249	170,855	9	5,230	9	5,070
Southern	29,791	32,600	3	960	3	1,185
Illinois and Indiana	240,537	215,866	10	6,905	11	7,570
Mich., Wis. and Minn.	30,637	29,391	2	990	2	980
Colo., Mo. and Utah	17,647	17,724	2	570	2	590
The South:						
Virginia	....	....	0	....	0	....
Kentucky	12,106	11,958	1	390	1	400
Alabama	99,742	108,592	7	3,030	8	3,620
Ferromanganese	....	....	0	....	0	....
Tennessee	....	....	0	....	0	....
Total	1,356,361	1,522,257	78	39,585	89	48,215

Industrial Applications of Soil-Heating Cable

TWO out-of-the-ordinary installations of soil-heating cable have been made by Cleveland industries, according to General Electric engineers. The cable—nickel-chromium wire covered with asbestos, taped with varnished cambric, and incased in a lead sheath for protection from moisture—is designed primarily for horticultural and agricultural uses.

A steel plant had difficulty in the winter time with its lubricant for roll-neck bearings, which congealed in the pipe lines. Formerly a steam pipe or air duct was nested with the pipe lines; now soil-heating cable has been wound around the pipes and insulation applied. An automatic, adjustable thermostat maintains the temperature of the lubricant at the proper point, irrespective of the weather conditions.

Another installation is in a paint plant laboratory, where soil-heating cable has been installed in a water bath which is used to maintain constant humidity for testing paints in a saturated atmosphere.

November Steel Production Will Be Lowest for Any Month Since April

Railroad Buying and Recovery of Automobile Industry Will Not Come Soon Enough to Reverse Present Trend—Scrap Declines Further

THE rate of decline in steel production has been retarded, but no early recovery is in prospect. It is now reasonably certain that average operations for November will be the lowest since April, when only 25.08 per cent of the country's capacity was employed, and they may fall below that figure.

The allotment of $135,000,000 of public money for railroad purchases and the gradual expansion of the public works program are favorable market factors, but are not likely to affect steel mill operations materially until late in the year. The subsidence of labor disturbances in the Detroit district is also regarded as a good augury, although no immediate effect on steel demand is looked for. The Michigan tool and die strike, by delaying work on new models, also delayed consumption of the heavy stocks of steel in the hands of motor car builders. Other steel consumers also have accumulations of material, bought under the stimulus of price advances, and with the year-end approaching are more interested in reducing their inventories than in further expanding them.

STEEL ingot output showed recoveries of 14 points to 40 per cent in the Cleveland-Lorrain area and of 16 points to 33 per cent in the South. The rebound at Cleveland, however, was due entirely to the desire of producers to complete water shipments to Michigan before the close of Lake navigation. In other steel centers the trend is still downward. In Chicago, where the ingot rate has receded only one point to 29 per cent, output may be approaching a resistance point. At Pittsburgh, operations have fallen four points to 21 per cent; in the Valleys they have dropped 10 points to 25 per cent; at Wheeling, two points to 38 per cent; in eastern Pennsylvania, four points to 18 per cent, and in Detroit, 36 points to 19 per cent. The industry as a whole will probably have difficulty in maintaining its scheduled rate of 25.2 per cent through the week. Indicative of the trend is the blowing out of three additional steel company blast furnaces, one each in the Pittsburgh, Cleveland and Chicago districts.

Another index of the immediate future in steel production is the behavior of scrap prices. THE IRON AGE composite price for heavy melting steel has dropped from $10.17 to $10 a gross ton, registering its tenth consecutive decline. THE IRON AGE composite for finished steel has receded from 2.023c. to 2.015c., reflecting the second reduction in rail prices.

THE first steps toward rail and track accessory purchases under the Government allotment of $51,000,000 have been taken. The Milwaukee Road has applied for a loan to cover orders for 50,000 tons of rails and 19,000 tons of fastenings. The Rock Island proposes to buy 20,000 tons of rails and 6400 tons of accessories, while the Burlington has ordered 5000 tons of rails and 8500 tons of track supplies from the Colorado mill.

The Reading Co. is reported ready to buy 5000 tons of rails with its own funds. Other carriers may decide not to take advantage of the opportunity to borrow public funds, preferring to make their own plans for expenditures without Government interference. The estimate that 400,000 tons of accessories will be bought is believed to be greatly exaggerated, even if 1,000,000 tons of rails are actually placed. The rolling of rails, assuming that they are promptly ordered, would probably not get under way until late in December or early in 1934, since no roads outside of a few in the South will want deliveries before next spring. A modification of the provision in the steel code prohibiting deliveries beyond three months after the closing of a contract will probably be necessary.

THE Government loan of $84,000,000 to the Pennsylvania Railroad will be used partly to finance purchases already made. A considerable part of the structural steel required for the railroad's electrification project has been rolled and is awaiting release at the mills or is lying along the right-of-way. Likewise, close to one-half of the 132 electric locomotives to be covered by the loan have been built. Mills are likely to benefit most from the Pennsylvania's freight equipment program, which calls for the purchase of 7000 cars, requiring 87,500 tons of bars, plates and shapes as well as 35,000 tons of wheels and steel castings.

Steel producers are awaiting with interest the results of the Government's canvass of railroad locomotive requirements.

Automobile production in October is estimated at 115,000 to 120,000 cars, and output this month will range from 50,000 to 60,000 units. Sizable orders for sheets and strip steel have been placed for bodies for the new Chevrolet car, but practically all General Motors assembly work has been suspended for the current month.

THE IRON AGE composite for pig iron is unchanged at $16.61 a gross ton.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Nov. 8, 1933	Oct. 31, 1933	Oct. 10, 1933	Nov. 7, 1932
Per Gross Ton:				
No. 2 fdy., Philadelphia	$18.26	$18.26	$18.26	$13.59
No. 2, Valley furnace	17.50	17.50	17.50	14.50
No. 2 Southern, Cin'ti	18.13	18.13	18.13	13.82
No. 2, Birmingham	13.50	13.50	13.50	11.00
No. 2 foundry, Chicago*	17.50	17.50	17.50	15.50
Basic, del'd eastern Pa.	17.76	17.76	17.76	13.50
Basic, Valley furnace	17.00	17.00	17.00	13.50
Valley Bessemer, del'd P'gh.	19.76	19.76	19.76	16.89
Malleable, Chicago*	17.50	17.50	17.50	15.50
Malleable, Valley	17.50	17.50	17.50	14.50
L. S. charcoal, Chicago	23.54	23.54	23.54	23.17
Ferromanganese, seab'd carlots	82.00	82.00	82.00	68.00

*The average switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	*$36.37½*	$37.75	$40.00	$40.00
Light rails at mill	32.00	32.00	32.00	30.00
Rerolling billets, Pittsburgh	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	26.00
Slabs, Pittsburgh	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh	31.00	31.00	31.00	31.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.60

Finished Steel

	Cents	Cents	Cents	Cents
Per Lb. to Large Buyers:				
Bars, Pittsburgh	1.75	1.75	1.75	1.60
Bars, Chicago	1.80	1.80	1.80	1.70
Bars, Cleveland	1.80	1.80	1.80	1.65
Bars, New York	2.08	2.08	2.08	1.95
Tank plates, Pittsburgh	1.70	1.70	1.70	1.60
Tank plates, Chicago	1.75	1.75	1.75	1.70
Tank plates, New York	1.98	1.98	1.98	1.898
Structural shapes, Pittsburgh	1.70	1.70	1.70	1.60
Structural shapes, Chicago	1.75	1.75	1.75	1.70
Structural shapes, New York	1.95¼	1.95¼	1.95¼	1.86775
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	1.70
Hot-rolled strips, Pittsburgh	1.75	1.75	1.75	1.45
Cold-rolled strips, Pittsburgh	2.40	2.40	2.40	2.00

Finished Steel

	Nov. 8, 1933	Oct. 31, 1933	Oct. 10, 1933	Nov. 7, 1932
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.25	2.25	2.25	2.10
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.35	2.35	2.35	2.20
Sheets, galv., No. 24, P'gh	2.85	2.85	2.85	2.85
Sheets, galv., No. 24, Chicago dist. mill	2.95	2.95	2.95	2.95
Hot-rolled sheets, No. 10, P'gh	1.75	1.75	1.75	1.55
Hot-rolled sheets, No. 10, Chicago dist. mill	1.85	1.85	1.85	1.65
Wire nails, Pittsburgh	2.10	2.10	2.10	1.95
Wire nails, Chicago dist. mill	2.15	2.15	2.15	2.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill	2.15	2.15	2.15	2.25
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh	$4.65	$4.65	$4.65	$4.75

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	*$11.50*	$11.75	$12.75	$9.25
Heavy melting steel, Phila	*9.75*	10.00	10.25	7.25
Heavy melting steel, Ch'go	8.75	8.75	9.62½	6.00
Carwheels, Chicago	9.50	9.50	10.00	7.00
Carwheels, Philadelphia	*10.75*	11.75	11.75	9.25
No. 1 cast, Pittsburgh	*11.25*	11.75	11.75	9.50
No. 1 cast, Philadelphia	*11.25*	11.50	11.50	9.25
No. 1 cast, Ch'go (net ton)	*8.50*	9.00	10.00	6.25
No. 1 RR. wrot., Phila	11.00	11.00	11.00	7.50
No. 1 RR. wrot., Ch'go (net)	7.25	7.75	8.50	4.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$1.75
Foundry coke, prompt	4.25	4.25	4.25	2.75

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery	8.00	8.00	8.50	5.00
Lake copper, New York	*8.00*	8.25	8.75	5.25
Tin (Straits), New York	*51.37½*	49.00	48.37½	23.65
Zinc, East St. Louis	*4.50*	4.75	4.75	3.00
Zinc, New York	*4.85*	5.10	5.12	3.37
Lead, St. Louis	4.15	4.15	4.35	2.90
Lead, New York	4.50	4.30	4.50	3.00
Antimony (Asiatic), N. Y.	6.70	6.70	6.87½	5.87½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

▲ ▲ ▲

▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Nov. 8, 1933	2.015c. a Lb.	$16.61 a Gross Ton	$10.00 a Gross Ton
One week ago	2.023c.	16.61	10.17
One month ago	2.036c.	16.61	10.87
One year ago	1.948c.	13.59	7.50
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel		Pig Iron		Steel Scrap	
	High	Low	High	Low	High	Low
1933	2.036c., Oct. 3	1.867c., Apr. 18	$16.71, Aug. 29	$13.56, Jan. 3	$12.25, Aug. 8	$6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Production Falls to 21 Per Cent of Capacity

Output Also Declines in Wheeling District and in Valleys — Scrap Is Weak, With Heavy Melting Grade Off 25c a Ton

PITTSBURGH, Nov. 8.—In the absence of support from the automotive industry and miscellaneous consuming lines, the local steel trade is now pinning its chief hopes for the remainder of the fourth quarter on the railroad purchasing program and public works projects. Heavy purchases by the carriers appear to be definitely assured by Federal loans of $135,000,000, of which $51,000,000 will be allocated for the purchase of steel rails and track accessories.

If the railroads take full advantage of Government financial aid, a good deal of benefit may eventually accrue to producers of bars, plates and shapes.

Public works projects continue to be slow in maturing, but several large construction jobs are nearing the letting stage, and may bring some much needed tonnage of structural steel and bars to mills before the end of the year. Demand for light rolled steel products continues to wane.

Ample consumer and jobber stocks are undoubtedly holding back considerable buying, and until inventories reach the replenishment point no general betterment in demand for steel is expected. Calls for sheets and strip steel from the automotive industry are notably diminished. Sheet mills are without significant backlog tonnage, and operations in this group are averaging not more than 35 per cent. Strip mills are in a similar position and are engaged at slightly under 40 per cent. Tin plate operations continue to resist the downward trend in other groups, and are still at capacity.

Output of steel ingots in the Pittsburgh area is down four points this week to 21 per cent of capacity. Production in the Wheeling district is slightly lower at 38 per cent. Operations in the Valleys and nearby northern Ohio mills have dropped sharply to 25 per cent of capacity. A steel company blast furnace in the Pittsburgh district was blown out in the past week.

The scrap market is notably weak. No. 1 heavy melting steel is off 25c. a ton to $11.25 to $11.75 Pittsburgh.

Pig Iron

Consumption of basic and Bessemer by non-integrated steel mills continues to shrink. Gray iron foundry activity in this district is also very sluggish. Movement against contracts is consequently diminishing week by week. New buying is nil. Current prices are unchanged for shipment through December. Quotations for first quarter will probably be announced on Dec. 1. No interest in first quarter iron has thus far appeared. Only one merchant furnace continues in blast in this district.

Semi-Finished Steel

Buying of billets and slabs is on a hand-to-mouth basis. Sheet bars continue to move briskly to tin plate mills, but deliveries to sheet mills are slackening. Wire rods are in poor demand. Forging billets are also quiet. Prices are unchanged for delivery through December.

Bars

Shipments are largely restricted to fourth quarter contracts entered prior to the recent price advance. Demand from the cold-finishers has not improved, nor has business from the automotive industry expanded in the past week. Miscellaneous tonnage is spread rather thin. Some hope is held out by the railroad purchasing program, which, if it be extended to replacement of rolling stock, should open up a fairly substantial demand for bars. Soft steel bars are quotably unchanged for delivery through the year at 1.70c., Pittsburgh.

Inquiry for reinforcing bars is slightly improved. The New York Central Railroad is taking bids on 900 tons for grade crossing eliminations at Syracuse. About 800 tons is required for State highway bridges, culverts and road construction in Ohio. Private projects are still hampered by credit limitations. Billet steel reinforcing bars, in stock lengths as quoted by distributers, are unchanged at 1.80c., Pittsburgh, for shipment through December.

Plates and Shapes

A local barge company has submitted the low bid on 48 steel pontoons, requiring about 1100 tons of plates, for the United States Engineer's office at Memphis. Other projected barge work is unimportant from a tonnage standpoint. Prospects of a sizable demand for plates from the railroads have been brightened by tentative proposals to apply part of the Federal loans to the carriers for new freight cars and locomotives.

The structural steel market has been enlivened by appearance of inquiries from the New York Central Railroad, which will require about 12,000 tons for grade crossing elimination at Syracuse, and from the United States Engineer's office at Pittsburgh, which has issued specifications for the Montgomery Island dam in the Ohio River, for which about 4000 tons will be needed. Other new structural work, although sprinkled with a few small private projects, is mainly for State bridge construction.

Sheets

Important consumers are virtually out of the market. Demand from the automotive industry has slumped further, with little hope of a noticeable pick-up before the new year. A primary reason for the current dearth of interest is held to be the well-stocked position of most consumers, who covered heavily before the new prices became effective. Sheet mill order books consequently reflect waning tonnages, and rolling schedules are gradually being reduced. Current operations are estimated at not more than 35 per cent of capacity.

Strip Steel

This market offers no exception to the general trend in demand. Buying by the motor car makers is very light, and miscellaneous purchases are restricted to small quantities. Unshipped fourth quarter tonnage is considered barely sufficient to sustain the present operating rate of 40 per cent.

Cold-Finished Steel Bars

Limited jobber interest continues to reflect heavy warehouse stocks. Specifications from other important consuming quarters, particularly from the automotive industry, are very limited. The 1.95c., Pittsburgh, price continues applicable to delivery through December.

Tin Plate

Producers see no reason to believe that capacity operations will not be maintained through the year. Specifications are well sustained, and pressure for deliveries has not relaxed. In what proportion deliveries are going into stock or into consumption is difficult to discern. Undoubtedly, a good share of current shipments is being taken in as coverage against possibility of a higher price next year. Spot buying at the current price of $4.65 is very light.

Tubular Products

Although demand for tubular products cannot be defined as improved, shipments are holding their own when

compared with deliveries in the latter part of October. Oil country goods are being taken in fair amounts, and standard pipe is being specified more frequently. Demand for locomotive boiler tubes and mechanical tubing is lacking. These classes of tubular products will probably enjoy an improved demand, however, if present plans for replacement buying by the railroads materialize.

Wire Products

Accumulated demand for wire mesh from jobbers who have been figuring recently on State road work in Pennsylvania is expected to reach wire mills in the near future. Aggregate tonnage in the offing for such work is about 2000 tons. Wire nails are rather quiet, as is manufacturers' wire. Demand from the agricultural areas is extremely poor.

Rails and Track Accessories

PWA funds, amounting to $135,000,000, have been set aside for aiding the railroads to purchase much needed rails, track accessories and new equipment. Fifty-one million dollars has been allocated for the buying of 844,525 tons of steel rails and 245,221 tons of track accessories. At the moment, no definite assurance is offered that all carriers will follow through in their original purchasing plans, as lined up with the transportation coordinator at Washington. Several carriers, however, are reported to be on the verge of final arrangements for purchases, and some rail tonnage should reach mills without much further delay. Steel company producers of track accessories are still uncertain as to the method that will apply to quoting on their products. Some revisions in the present code restrictions covering delivery periods, it is pointed out, will obviously be necessary before negotiations can reach a definite point. The largest slice of the Federal loan will go to the Pennsylvania Railroad for completing its New York-Washington electrification program. The Reading Co., is reported to be ready to purchase 5000 tons of steel rails with its own funds.

Coke and Coal

Standard Connellsville furnace coke continues quotable at $3.75, ovens. Ordinary Connellsville foundry coke is still available at $4.25, ovens, while premium brands of this grade are available at $5.25 for both spot and contract delivery. *Very little coke buying is reported. Coal markets are extremely quiet. Commercial mines are operating normally, and* captive bituminous mines are gradually becoming active with the partial return of striking miners to the pits this week.

Scrap

Prices have softened further as the result of an almost complete lack of consumer buying. No. 1 heavy melting steel is 25c. a ton lower at $11.25 to $11.75. This range has been substantiated by a consumer purchase of a small tonnage at around $11.75. Based on a recent consumer purchase in this district, No. 1 cast is quotably lower at $11 to $11.50. Practically all scrap on the last Pennsylvania Railroad list is reported to have been purchased by dealers for yard stocks. The No. 1 steel on the list brought from $11.25 to as low as $10.50. While purchases of railroad scrap ordinarily provide a gage of the market, in this case absence of shipping instructions to consuming points has minimized the importance to the general market of the prices disclosed in the dealer bids. Dealer order books are virtually exhausted and, with suspensions still in effect at most consuming points, movement of all grades of scrap is extremely light. Despite the generally weak market tone, dealers with long positions are not disposed to tempt buyers with bargain offerings.

Scrap Prices Decline at St. Louis

ST. LOUIS, Nov. 8—This was another quiet week in the pig iron market. Shipments by makers continued to show a falling off, and very little new business was placed. Not much in the way of new commitments is expected before the end of the year. Stove factories are said to be winding up their season.

The Scullin Steel Co. will close indefinitely because of poor business and continued operating losses, it is announced by Harry Scullin, president. Its production for years has been largely railroad materials. The Missouri Highway Commission on Oct. 28 opened bids for highway projects requiring 660 tons of structural steel and 685 tons of reinforcing bars. The Laclede Steel Co. has been awarded 203 tons of reinforcing bars for various local projects.

Warehouses here have established a new quantity differential on hot-rolled products, the base being 400 to 9999 lb., with deductions of 15c. for 10,000 to 19,999 lb., 25c. for 20,000 to 39,999 lb. and 35c. for 40,000 lb. and up, and addition of 50c. for under 400 lb.

Scrap prices have declined. Selected heavy melting steel, No. 1 heavy melting, cast iron borings, machine shop turnings, cast iron car wheels and railroad malleable are 25c. a ton lower, and No. 2 heavy melting, railroad springs, steel rails less than 3-ft. and No. 1 railroad cast are 50c. lower. The St. Louis Southwestern sold 26 carloads at low prices. The Missouri-Kansas-Texas has a list of 30 cars pending.

Code Proposals Perplex New England Foundries

BOSTON, Nov. 8.—With a majority of New England foundries operating two to three days a week, many of them have misgivings as to the practicability of the proposed code which calls for a 40-hr. week and a minimum wage of 40c. an hour. The pig iron market seems to be on dead center, with little prospect of showing more life until books are opened for first quarter shipment, which will be around Dec. 1. Sales the past week approximated 500 tons only, and there are no inquiries in the market.

On the surface, the scrap market looks weaker, but business has been so quiet that there has been no real test of prices. Consequently brokers are standing pat on quotations. Current business centers very largely in long bundled skeleton, No. 1 steel, No. 2 steel, breakable cast and steel turnings. There is some interest in engine blocks and chemical borings, however.

The price of cast iron pipe has been advanced from around $32.50 a ton, base New Jersey shipping points, to $40 a ton. Foundries have lined up a large amount of tentative business in anticipation of the price advance, but much depends on the ability of municipalities to obtain Government financial aid.

Coast Mills Figuring on Large Hawaiian Tonnage

SAN FRANCISCO, Nov. 6.—Major tonnages are called for in several Federal projects on which dates for bids have been set. At Pearl Harbor, T. H., plans for a pier and quay walls have been enlarged so that 6500 tons of reinforcing bars, 125 tons of sheet piling and 200 tons of cast iron pipe will be required. A foundry building and four cranes at the Navy Yard call for 400 and 2500 tons of structural steel respectively. At Mare Island, Cal., the Navy causeway specifies 1200 tons of structural steel, while hangars at Hamilton Field will require 2600 tons of structural and 300 tons of reinforcing bars.

The first sizable tonnage of several weeks for private construction was reported for the Standard Brands building in Oakland, Cal. This structure, requiring 1000 tons of structural steel, may indicate a resumption of general building activity as distinguished from public works.

Awards of cast iron pipe have been for heavy tonnages, with an aggregate of 5943 tons being reported. Lettings of structural steel and reinforcing bars were light, with a total of 923 tons and 916 tons respectively. Soule Steel Co. booked 550 tons of bars for three barracks buildings at Hamilton Field.

Chicago Operating Rate Is Off Only One Point

Decline in Steel Business Has Been Retarded, With Output Now Averaging 29 Per Cent—Scrap Prices Still Sagging

CHICAGO, Nov. 8. — Both new sales and specifications for finished steel are lower, but the drop has been less pronounced than in recent weeks. This situation is reflected by ingot output, which, after dropping sharply for two weeks, now stands at 29 per cent of capacity, a loss of one point in the last seven days. The leading producer has blown out a stack, leaving two active blast furnaces at Gary and three at South Works.

The immediate future of this market will depend on miscellaneous business, which is relatively steady, and on rail orders and public works. There remains a fair tonnage to be placed for highway bridges on which prices have been taken. New inquiries for this kind of work are in smaller number. Dates for taking bids on several of the dams on the upper Mississippi River have been set further into future and there are other signs that the preliminary work on these projects is somewhat behind schedule.

Waiving of some code restrictions appears to be necessary before rail orders will be placed. The railroads, it is understood, will buy direct and not through a central agency, as was intimated at the time the requirement pool was started. A moderate increase in demand for wire products is coming from the manufacturing trade. Farmers are still defiant and in the North and Northwest have now been cut off from outdoor work by the first winter blasts.

Pig Iron

Prices for Northern foundry iron are strong, but there is no real indication at present that new schedules will be filed except to cover first quarter deliveries. Shipments are beginning to grow and dealers expect the pace to become more rapid as consumers take the remaining tonnages in contracts expiring Dec. 31. The melt is steady but is below the rate of current deliveries. Very small quantities of charcoal and Southern iron are being sold.

Steel Sheet Piling

New prices for this commodity are now in full effect. The Great Lakes Dredge & Dock Co. is buying 1000 tons for work at Port Washington, Wis. There is still a round tonnage to be placed for dams on the upper Mississippi River.

Rails and Track Supplies

Mills and railroads are confronted with a number of technicalities which must be straightened out before rail buying will actually bring tonnage to books. It is apparent that a special ruling will be necessary to permit deliveries to extend far into next spring. It is understood that this modification of the code will first be applied to rails and later extended to track supplies. A number of Western railroads are well advanced in their programs and they may send orders to mills on short notice. The Soo Line may take water shipment before the close of navigation. Current orders for track accessories for general maintenance work are extremely light.

Wire Products

A moderate upturn in orders is coming from light manufacturers and to a very limited extent from jobbers. The automobile industry is giving little support to this market. The question of agricultural demand for wire products now resolves itself into favorable crop weather this winter, the size of crops next spring and the prices obtained for them. Farmers, especially in the Middle West, are in a poor frame of mind and only higher profits will bring them into the market. Wire output remains steady.

Cold-Rolled Strips

Demand continues to slow down in the absence of tonnage business from the automobile industry. The only indication of future needs for automobiles is given by a substantial amount of die work that is being done by Chicago shops for plants at Detroit now affected by strikes.

Plates

The Great Northern is taking figures on 1200 tons of steel for the repair of 500 cars in its own shops. Otherwise the railroad equipment market is quiet. The Chesapeake & Ohio has done some work on a car program but it is generally believed here that little real attention will be given to equipment until rail buying is out of the way. The Miller brewery at Milwaukee still has 1000 tons of plates pending, and 250 tons will be used for gas holders to be shipped to South America.

Bars

Demand for bar mill products continues to taper. Accumulations in the hands of consumers are sizable. Activity among farm machinery builders has slackened except here and there where winter programs are being started to provide work for old employees.

Structural Material

Total bookings for October are now available and the month turned out to be one of the poorest on record in so far as the Chicago district is concerned. The outlook is far from bright, with most prospective work tied in with a few highway bridges and the dams on the Mississippi River. Awards for the week total only 1500 tons, while new inquiries call for 3800 tons exclusive of 6200 tons for buildings at San Francisco. Federal funds amounting to $2,500,000 are to be made available for 18 postal substations in Chicago.

Reinforcing Bars

Awards are in small volume, but all indications point to improvement on the promise of tonnage from public works programs. Dealers expect orders at an early date for several locks and dams on the upper Mississippi River, and a bridge at Lyons, Ill., calling for 180 tons, has been added to the long list of pending road projects in this State. Small inquiries and awards are more numerous and it is noticeable that private work is slightly more plentiful.

Cast Iron Pipe

The only new inquiry of moment comes from Chicago, which is seeking prices on 400 tons of special castings ranging in size from 16 to 48 in. The 200 tons of 20-in. pipe recently asked for by Chicago is still pending. Green Bay, Wis., has awarded the general contract for a pipe project, but the pipe itself has not yet been placed. A number of municipalities have indicated where they will buy pipe, the agreements being contingent on loans being obtained for the work in mind.

Scrap

This market is dull, not only from the standpoint of purchases but also because consumers, including steel mills, have practically stopped accepting shipments. Prices are easy, with new lows established for many grades which are dropping in sympathy with the lower prices quoted for the heavy tonnage grades. All car wrecking operations in and near Chicago have been stopped as a means of checking the inflow of scrap, which cannot at this time be placed in consumers' yards. Dealers are buying cast iron borings for Milwaukee docks for movement by boat in the spring.

New York Steel Trade Looks to Railroads for Business

Pennsylvania Car Program Will Call for 87,500 Tons of Finished Steel—N.Y.C. Grade Separation Work Involves 12,000 Tons

NEW YORK, Nov. 8.—Steel specifications have fallen off sharply in virtually all products. Even tin plate releases are growing lighter. With consumers comparatively well stocked, no upturn in business is looked for until the Government-sponsored railroad program is translated into orders.

There is considerable doubt whether much rail tonnage will be rolled until January even if orders are promptly distributed. Few of the railroads will want delivery until weather conditions permit track laying and the mills will not be disposed to accumulate large stocks in their yards. Rolling stock purchases are likely to affect mill operations sooner. Thus far the Public Works Administration has arranged for the financing of 135 electric locomotives and 7000 freight cars for the Pennsylvania. The freight cars, of which 3000 to 4000 will be built in the railroad's own shops and the remainder placed with private builders, will require 87,500 tons of bars, plates and shapes and 35,000 tons of wheels and steel castings. A large tonnage of steel will be required also for the completion of the Pennsylvania's electrification program, which is likewise covered by a PWA allotment.

The New York Central, in cooperation with the State of New York, will soon undertake grade separation work in Syracuse which will involve the construction of 26 bridges, calling for 12,000 tons of structural steel. The Poirier McLane Corpn., New York, is low bidder on the general contract for the latest section of the West Side highway, Manhattan, requiring 8000 tons of structural steel. There is little private building activity.

Pig Iron

The melt has declined somewhat during the past three weeks, but the slightly improved volume of present shipments indicates a slight recovery in foundry activity. Fresh purchasing is almost totally confined to miscellaneous prompt and November carlots. Jobbing foundries are not evincing much interest in December supplies. Bookings during the past seven-day period aggregated 2400 tons, against 3000 tons in the preceding week and 2600 tons a fortnight ago. Buyers are indicating no desire to forego their conservative attitude and cover far ahead. Foundry stocks generally are not large, but observers believe considerable tonnage will carry over into the first quarter. It is expected that early 1934 prices will show a substantial advance when announcement is made the latter part of November.

Reinforcing Steel

Awards during the past week consisted of about 650 tons of road mesh for highway construction on Long Island and upper New York State to be supplied by American Steel & Wire Co. The 1300 tons for bridges and approaches for the Erie Railroad at Elmira, N. Y., was divided between Truscon Steel Co. and Jones & Laughlin Steel Corpn., and various projects near Buffalo, aggregating about 500 tons, were awarded to Kalman Steel Corpn. Pending awards include 1900 tons of bars for a Philadelphia dry dock and a grade separation program at Syracuse, N. Y. No announcement has yet been made concerning the Manhattan post office annex and West Side elevated highway.

Scrap

Additional weakness in outside selling markets has not affected the No. 1 and No. 2 heavy melting grades in this district, and brokers are making regular and substantial daily loadings for export accounts. At Philadelphia No. 2 is being loaded on car at $7.75 a ton, for Japanese and Italian melters. The Phillipsburg, N. J., consumer continues to take good tonnages of No. 1 and No. 2 cast grades which are being loaded on cars at Jersey City. Heavy melting grades for export are unchanged and apparently firm at $7.50 and $6.50 a ton, barge, for No. 1 and No. 2 respectively, but all other grades are quotably nominal since domestic activity remains at a standstill. Although heavy export bookings have been made during the past month new business recently has contracted, and Japanese and Italian importers are showing less willingness to continue to meet present domestic quotations. Polish shipments have declined, but current activity continues comparatively heavy.

Foundry Melt Off in Cincinnati District

CINCINNATI, Nov. 8.—A sale of 400 tons of Northern foundry iron to a south central Ohio melter boosted the week's sales above the average of the past month. Total bookings were about 600 tons, the additional 200 tons representing carload purchases. Furnace interests report that shipments are slowing up, since melt is declining and foundries are piling iron. Some foundries supplying automobile parts and stove castings are operating at full time, but the majority either are operating alternate weeks or are running a few small heats each week. The failure to complete negotiations on the foundry code is contributing to uncertainty in the trade, particularly in view of continued price shading in some quarters. The establishment of the code is expected to aid materially in rectifying this situation. The pig iron market is without inquiry, current business being the result of urgent consumer need.

Coke

By-product foundry coke is quotable at $9.50, delivered in Cincinnati, this month. Interest in new coverage is nil. Shipments are steady at a level above that of November, 1932.

Steel

A small increase in automotive sheet specifications, the past week, gave a slightly brighter tone to the market. Demand is still below 40 per cent of mill capacity and rolling schedules are being held to the same level. Current orders are for immediate use.

Warehouse Business

Modified quantity differentials on hot-rolled products have been adopted. Orders from 400 to 9999 lb. take the base price and a deduction of 15c. per 100 lb. is allowed on orders for 10,000 to 19,999 lb. On orders up to 39,999 lb. the deduction is 25c. and for over 40,000 lb. 35c.

Scrap

Some melting steel and sheet clippings are moving on contract, but cast scrap is without a market. Prices continue to be steady with the possibility of further downward revision. Some distress material is being offered, but dealers are buying conservatively and chiefly for application on old orders.

Output Only 18 Per Cent in Eastern Pennsylvania

Steel Mills Not Likely to Benefit Much From Pennsylvania Railroad Program Until Next Year — Scrap Off Again

PHILADELPHIA, Nov. 8.—Interest here now is centered in business that will be placed by the Pennsylvania Railroad for completion of its electrification project between Wilmington, Del., and Washington, D. C. For this purpose the railroad has arranged for a loan of $84,000,000 through the Public Works Administration.

Details for tonnage requirements are being worked out and until completed it is not possible to state what they will be. It is realized that some of the structural material and other requirements for this project have been rolled. This tonnage now is either at mills awaiting release or is lying along the right-of-way. The new tonnage probably will not reach mills in large quantities until early next year.

It is said that about one-half of the 132 electric locomotives included in the Pennsylvania program have been built, with 42 in service between New York and Wilmington. The greater part of the steel required for these units will consist of sheets.

There is expected to be comparatively early placement of part of the steel requirement for 7000 freight cars to be built by the Pennsylvania, roughly estimated at 60,000 tons of plates, shapes and bars. It is reported that about half of these cars and some of the electric locomotives will be built in the Pennsylvania's own shops. It is doubted whether the pending 1,000,000-ton rail and 400,000-ton track accessory orders to be financed by the Government will be placed in large lots until after the first of next year. The matter of determining prices on track fastenings and tie plates is still under consideration at Washington.

The Atlantic Coast Line has put out an inquiry for 2500 tons of tie plates for 1934 delivery, 1000 tons each in the first and second quarter and 500 tons in the third quarter.

A further let-down in the market has developed and open-hearth operations have dropped four points to 18 per cent of capacity.

Pig Iron

Foundry melt has shown a further decrease, but foundrymen report a slight increase in inquiries and may be in the market soon for pig iron requirement. The Navy Department will open bids on Nov. 14 for 150 tons of foundry iron for delivery at the Washington, D. C., and Puget Sound Navy Yards.

Plates, Shapes and Bars

Mills in this district are awaiting with interest definite plans of the Pennsylvania Railroad regarding tonnage requirements for its Wilmington, Del.-Washington, D. C., electrification program for which it has arranged for a loan of $84,000,000 from the Public Works Administration. Details are being worked out by Pennsylvania Railroad officials and may be completed within a few days. It is doubtful, however, if much tonnage will get to the mills this year. Of the $2,500,000 schedule to be expended on or before Dec. 1 and $4,500,000 for December, it is believed a great portion will be for labor on the considerable quantity of materials on projects interrupted during the past two years. Much of this material has been rolled and now is either at mills awaiting release or lying along the right-of-way. The larger new tonnages will be placed with the mills next year. However, the $16,000,000 to be expended for 7000 freight cars may be used for the purchase of some new tonnage before the end of the year. It is impossible accurately to estimate the plate, shape and bar requirements for these cars, but roughly they have been placed at about 60,000 tons. Other estimated outlays from the $84,000,000 program include $18,000,000 for electric rolling stock and $50,000,000 for tunnels, other electrical work and improvements.

New business in plates, shapes and bars is light and backlog tonnage is almost exhausted. Bids will be opened Nov. 15 by the Wilmington, Del., Board of Education for a high school, requiring about 1500 tons of structural steel. The State of Pennsylvania is speeding up the use of PWA funds for highway work and is opening bids twice a month. The Kalman Steel Corpn. has been awarded 100 tons of reinforcing bars for a State bridge near Somers Point, N. J.

Sheets

Automobile body builders are purchasing only small lots, and have fair-sized stocks on hand. New dies are being tried out in preparation for forthcoming 1934 models and it is expected that requirements for the latter will be placed early in December. Radio and stove manufacturers are fairly active buyers.

Warehouse Business

Jobbers have revised prices on reinforcing steel bars and established new cutting charges. Effective Oct.

NON-SHRINK, OIL HARDENING

TOOL STEEL TUBING

The job of making ring dies, cutting dies, bushings spacers, etc., is half done when you start with Bissett Tool Steel Tubing. There is a size carried in stock to meet every requirement up to 12″ O.D. and 2″ wall thickness. Larger sizes can be supplied.

It eliminates forging, does away with annealing difficulties and cuts down machining cost.

We also supply special tubing to S.A.E. 52100 and S.A.E. 4615 analysis for Ball Bearing purposes.

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

THE BISSETT STEEL CO., INC.

915 E. 67th STREET, CLEVELAND, O.

Cincinnati Pittsburgh Buffalo

23, the new price is 1.95c., base, Pittsburgh, for 5 tons or more, and 2.05c., base, Pittsburgh, for less than 5 tons. The Philadelphia base price for 5 tons or more is 2.28c. and for less than 5 tons it is 2.43c. Old size extras continue to apply. The new cutting extras are: Over 24 in. to 48 in., inclusive, 5c. per 100 lb.; over 12 in. to 24 in., inclusive, 20c. per 100 lb. Cutting charges for sizes for 12 in. and under will be furnished on application, but will not be less than 30c. per 100 lb.

Imports

The following iron and steel imports were received here last week: 1226 tons of pig iron and 550 tons of chrome ore from British India; 39 tons of steel bars, 37 tons of structural shapes and 11 tons of steel bands from Belgium; 15 tons of steel tubes, 10 tons of steel bars, 8 tons of steel rods and 5 tons of steel billets from Sweden, and 10 tons of zirconium ore from Brazil.

Scrap

The domestic market is extremely dull. Mills are running at a low rate and have sufficient supplies on hand to maintain the present rate of requirements for some time. The market has showed further weakness, with No. 1 heavy melting down 50c. a ton. The only interest in the market in this district lies in export orders for No. 1 and No. 2 heavy melting steel for Japan.

Drastic Cut in Output in Valleys Forces Rate Down to 25 Per Cent

YOUNGSTOWN, Nov. 6.—Steel producers in the Valleys and nearby northern Ohio mills have been forced to reduce operations drastically in the past fortnight. Ingot output at the outset of the current week averaged not more than 25 per cent of capacity, contrasted with approximately 50 per cent at the middle of October.

The precipitate decline in ingot production has followed in the wake of an ebbing consumer demand. With practically all third quarter tonnage cleaned up, producers can boast of very little fourth quarter tonnage still to be shipped. Spot orders are coming in irregularly, and, in many cases, represent business of a special character. Sheet and strip demand is naturally being depressed by the lag in automobile production and by the generally sluggish tone of miscellaneous consuming quarters. Sheet requirements for container manufacture are rather spotty, fluctuating with the status of experiments and tests with various sheet metals for beverage containers. A recent order for 250 tons of stainless steel sheets for insulated beer barrels was placed with the Republic Steel Corpn., which will roll the sheets at its alloy division, Massillon, Ohio.

①
Pres.— That's bad. Guess I better let you get back to Ryerson. They may not be so near —but they do have complete stocks and ship at once.
Purch. Agent—Can't I use .025 instead? No! Will delivery be O. K. next Tuesday? No! XX XX+X @ ....
RYERSON STEEL - SERVICE
(Continued on next page)

Finishing mill schedules are running slightly ahead of open-hearth activities and average 30 per cent of capacity. Further scaling down is considered likely, however, unless there is a reverse trend in incoming business very soon. Pipe mill activity is not so brisk as it was in October, when shipments were equal to those in September. Demand for electric welded pipe is very quiet, but interest in small diameter pipe, for tubing wells in shallow oil fields, is fairly satisfactory. Current demand for oil country goods also extends to drill pipe and casing. Standard pipe is moving slowly. Bars, plates and shapes are generally dull.

Valley steel producers, though not in line for rail orders, expect to benefit from orders for tie plates and other track accessories to be placed in conjunction with rail tonnage. Furthermore, if the carriers' program be expanded to include purchases of rolling stock, which now seems likely, producers in this district hope to enjoy a share of the attendant business for steel required for railroad equipment manufacture.

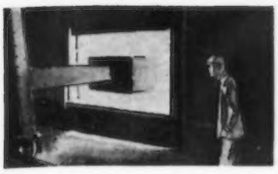
Primary materials markets here are practically lifeless. Hardly any scrap is moving to steel mills, and purchases of No. 1 steel in the past month have been negligible. Scrap prices are generally nominal, with No. 1 heavy melting steel procurable in restricted quantities at around $12 a ton. Foundry melt has diminished, and the movement of pig iron is slower. Releases against old low-price orders, however, are still frequent enough to indicate that such contracts will generally be completed by the code deadline on Dec. 31.

Continued unsettlement in the captive coal mines has not affected the fuel position of large consumers. Quiet covering, ever since the inception of labor disturbances, has been in progress, and in most cases steel producers are adequately assured against fuel shortage for the next few months. Steel producers still are faced with uncertainties surrounding operating costs. Until such time as the miners return to work, the question of higher steel costs, according to local observers, will be unanswered.

Detroit Scrap Market Marking Time

DETROIT, Nov. 7.—The local scrap market is devoid of activity as all classes of users mark time. The district steel plant has taken off three open-hearth furnaces and, with a considerable stock of scrap in its yards, is disinterested in further purchases at the moment. A few boat shipments of scrap on old contracts have been made to Cleveland and Buffalo. Prices are unchanged, but are showing a tendency to soften.

Output Rises 14 Points to 40 Per Cent at Cleveland



Steel Producers Add Furnaces to Make Lake Deliveries Before Navigation Closes —Fisher Body Plant Orders Steel for New Chevrolet

CLEVELAND, Nov. 8—Ingot output in the Cleveland-Lorain territory increased 14 points to 40 per cent of capacity this week. One local producer added five open-hearth furnaces and another put on one additional open-hearth. Production has been increased to enable local steel plants to make water shipments of sheet bars to Monroe, Mich., and merchant bars to Detroit before the close of Lake navigation. A blast furnace in Lorain went out Sunday, leaving only one in operation.

Some good specifications for steel bars, plates and shapes for car repair work were issued during the week. With this exception orders were light. Miscellaneous demand is confined to small lots and shows no upward trend.

A revival in new demand from the automotive industry is indicated in the placing of some sizeable orders for sheets and strip steel for making bodies for the new models of Chevrolet cars in the local Fisher body plant. This business was divided among several mills. Tool and die shops in northern Ohio are busy on automotive orders diverted to this territory because of the Michigan strike.

Awards of 2900 tons of steel for local public work were made during the week and considerable tonnage is still to be let.

Pig Iron

The market continues dull with sales limited to car lots. Shipments show little change. Shipping orders are expected to improve later in the month, as consumers are obligated to take out the iron covered by their fourth quarter contracts. While the current requirements of the automobile foundries are light, the General Motors Corpn. is accumulating large stocks at its Saginaw foundries in water shipments, much of it from Cleveland furnaces and it is estimated that these stocks will be close to 200,000 tons when the season of navigation closes or somewhat larger than a year ago.

Iron Ore

October shipments of Lake Superior ore were 4,542,510 tons, an increase of 3,615,949 tons over October last year. The movement by water for the season up to Nov. 1 was 20,842,083 tons, an increase of 17,524,367 tons or 528 per cent over the same period last year. The movement is rapidly dwindling and November shipments are not expected to exceed 500,000 tons.

Bolts, Nuts and Rivets

Jobbers have stocked up with bolts and nuts for the remainder of the year on orders placed before Nov. 1 when the price advance became effective. Considerable business also came from automobile manufacturers for new models, as well as from other consumers. Pending rail purchases are expected to stimulate the demand from railroads. Some carlot rivet business has been placed at the new price of $2.75 per 100 lb. Some good business is in prospect from pending public work.

Bars, Plates and Shapes

Cleveland has placed additional orders of 2100 tons of welded steel pipe for water mains and 800 tons of reinforcing bars. Lake shipyards have an inquiry from the Standard Oil Co. of Ohio for two or four oil barges, each requiring 600 tons of plates and shapes. The Ohio highway department has issued another list of projects, including bridges requiring 200 tons of structural shapes. Private construction work shows some improvement, but few of these jobs require over 50 tons of steel.

Warehouse Business

Local warehouses have revised quantity differentials on hot-rolled steel to conform with those decently named in the Pittsburgh district. These warehouses also have eliminated the $3 a ton extra on cold-finished flat bars. Quantity differentials on cold-finished steel are revised to $1.25 for orders under 300 lb.

Sheets

The Fisher Body Corpn. during the week placed orders for considerable tonnage for its Cleveland plant for Chevrolet bodies, the business being divided between several mills. Specifications were filed for some of the material. While releases have not yet been issued, it is stated that the local Fisher plant will get under production shortly on bodies for new models and that the sheets purchased are for late November and December requirements. Generally the market is dull. Steel barrel manufacturers are still fairly busy making alcohol barrels. Production in the refrigeration industry has slowed down.

Strip Steel

New demand is dull, although some business in hot-rolled strip for making Chevrolet bodies in its Cleveland plant has been placed by the Fisher Body Corpn. Quite a little new activity

2
Purch. Agent—Oh, nothing—Just the job, I guess. If companies wouldn't bluff and take orders for material they don't have—
Wife—Why! What's the matter, Dear, you look so tired.
RYERSON STEEL - SERVICE

(Continued on next page)

has sprung up in cooperage stock for manufacturers of wooden beer barrels.

Coke

A 50c. per ton price advance has been made on Painesville by-product foundry coke, which is now quoted at $9.27, delivered Cleveland.

Scrap

Shipments in small lots are still being taken by Youngstown district mills, but there is no new demand and dealers do not look for much activity before the first of the year. The Nickel Plate railroad will take bids Nov. 9 on 3500 tons in miscellaneous grades.

Partial Recovery in Steel Output in South

BIRMINGHAM, Nov. 8.—Both the pig iron and steel markets are marking time. In recent weeks there has been little new business. Most of the larger foundries have contract balances which they are drawing on and this accounts for the lack of new tonnage. Some foundries are buying only for immediate requirements, but this volume is small and irregular. The price remains at $13.50. Six blast furnaces are active, the same as during the past three weeks.

Steel buying has been very drastically curtailed as reflected by open-hearth production. Most of last week only four units were worked, these being at the Gulf States Steel Co. plant. At Fairfield the Tennessee Coal, Iron & Railroad Co. operated four units until Tuesday, then closed its open-hearth plant until Sunday, when four resumed production. The schedule for the present week is eight furnaces, the Tennessee company and Gulf States Steel Co. each having four. The only early relief in sight for steel is the Government rail tonnage. This district hopes to be allotted 100,000 tons or more which would make possible a good schedule at the Ensley works.

Canadian Iron and Steel Output Maintained

TORONTO, Ont., Nov. 8.—Operations are again showing improvement in the Canadian iron and steel industry. Announcement was made during the week that two or three foundry companies that had been idle for some time will immediately start up on a capacity basis. These plants, however, are understood to be associated with the automotive industry, which is now starting on new car models for next year delivery. Steel mills are holding operations at recent levels, with no large tonnage contracts reported for the past month or two. The mining industry continues to buy machinery, tools and steel in good quantities and is furnishing a large amount of diversified business to the steel industry.

While pig iron sales are holding at a steady level, no large contracts are being placed, and producers have very little business on their books for last quarter delivery. Sales are mainly in single car lots. Foreign competition is at a standstill. Prices are firm and unchanged.

Scrap is again inactive, having lost the support of export demand. Dealers are out of the market and price lists are unchanged.

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Wife—Come, Jim, Dear—Corn muffins. !!!!
Purch. Agent—That's swell, Darling. Everything will be fine—till tomorrow.
RYERSON STEEL - SERVICE

(Continued on next page)

More Construction Work In Sight at Buffalo

BUFFALO, Nov. 8.—Pig iron business booked during the week was below the average for May or June, but considerably better than one year ago. The two sizeable inquiries mentioned last week have apparently not yet been placed, and no new sizeable lots are out for placing. Shipments are keeping up well and a survey of the foundries throughout the eastern and central part of the State shows that the melt is being surprisingly well maintained.

Steel

Plans are out for replacement of tracks by the New York Central Railroad at Albany. A large tonnage of reinforcing bars will be required, but the amount is still indefinite. A grade crossing elimination in East Aurora, N. Y., will require 190 tons of reinforcing bars. Bids are expected to go in Dec. 20 for the new Kensington high school in Buffalo, to require 1400 tons of structural steel. A 300-ton State highway bridge in New Hampshire was awarded to a Buffalo fabricator. Steel works operations are the same as last week.

Scrap

The market for scrap is listless, although one sale of 1000 tons of short mixed borings and turnings was made at $6.50. There is an entire absence of any transactions of this size, or anywhere approaching it, in other commodities. One of the local mills is continuing to receive sizeable barge canal shipments of scrap.

Pipe Lines

Cleveland has placed 1300 tons of 30-in. welded steel pipe with Alco Products, Inc., and 800 tons with National Tube Co. for water main extensions. This is in addition to 2000 tons placed with former company a few weeks ago.

Central Michigan Natural Gas Co., Lansing, Mich., is considering a welded steel pipe line from natural gas fields, Isabella County, to Lansing and vicinity, about 80 miles.

Vega, Tex., plans natural gas distribution system. Cost $100,000, with pressure and distributing station. Financing is being arranged.

Miller & McCloskey, Alma, Mich., plan 6⅝-welded steel pipe line from Mount Pleasant, Mich., gas fields to St. Louis, Clare, Alma and vicinity, about 45 miles. Financing is being arranged.

Colorado Springs, Colo., will build about 10 miles of 20 and 22-in. steel pipe line for high pressure water system. Entire project will cost $1,250,000, including new dams and reservoirs. Financing has been arranged.

Stanolind Pipe Line Co., Philcade Building, Tulsa, Okla., plans 8-in. steel pipe line from oil fields at Perry, Okla., to Drumright, Okla., about 45 miles, for crude oil. Quantity of pipe now available at Ponca City, Okla., will be cleaned and repaired for part of new line.

General Natural Gas Corpn., Fallsburgh, N. Y., has increased capital from $20,000 to $50,000 for expansion.

Board of Public Service, St. Louis, is preparing application for federal grant of $865,261 for 60-in. pipe line from the city's Missouri River waterworks to Grand Boulevard and Eichelberger, a distance of 13 miles. Cost about $1,217,538; city has available $852,277 waterworks fund.

Fabricated Structural Steel

Lettings Decline—New Projects in Good Volume

AWARDS of 6450 tons are the lowest since the middle of September and compare with 16,450 tons a week ago. No sizable booking was reported. New projects, on the other hand, are in good volume, totaling 26,900 tons, compared with 11,230 tons last week. The outstanding new job is 12,000 tons for grade separation work at Syracuse, N. Y., to be financed jointly by the New York Central Railroad and the State of New York, bids to be taken Dec. 4. Other new projects include 4000 tons for a dam at Montgomery Island, near Pittsburgh, and 2200 tons for hangars for the Naval base at Mare Island. At Chicago, the tonnage is being estimated on 18 postal substations. Structural steel lettings for the week follow:

NORTH ATLANTIC STATES

Henniker, N. H., 300 tons, State highway bridge, to Lackawanna Steel Construction Corpn.

Thurman Station, N. Y., 164 tons, State highway bridge, to Fort Pitt Bridge Works Co.

Newark, N. J., 300 tons, stock house for Krueger Brewing Co., to McClintic-Marshall Corpn.

Flemington, N. J., 450 tons, barrel racks for Thompson-Starrett Co., to Bethlehem Fabricators, Inc.

Utica, N. Y., 170 tons, West End Brewing Co. building, to Utica Steam Engine & Boiler Works.

New York, 120 tons, 180 Fulton Street store, to George A. Just Co.

Queens County, N. Y., 190 tons, highway bridge, to National Bridge Works.

Baltimore, 240 tons, Johns Hopkins Hospital garage, to Truscon Steel Co.

SOUTH AND SOUTHWEST

Jacksonville, Fla., 360 tons, terminal building, to Ingalls Iron Works.

Supply, Okla., 550 tons, bridge, to Capitol Iron & Steel Co.

Atoka County, Okla., 250 tons, bridge, to Illinois Steel Bridge Co., Jacksonville, Ill.

Paris, Tenn., 200 tons, bridge, to Bedford Foundry & Machine Co.

CENTRAL STATES

Cleveland, 140 tons, building for Producers Milk Co., to Austin Co.

Leavittsburg, Ohio, 570 tons, State highway bridge, to Mount Vernon Bridge Co.

State of Ohio, 720 tons, horses and props for dams Nos. 45, 46, 49 and 50 on the Ohio River, to American Car & Foundry Co.

De Witt County, Ill., 200 tons, bridge, to Illinois Steel Bridge Co.

Chicago, 100 tons, storage building, to Wendnagel & Co.

Appleton, Wis., 216 tons, additions to Appleton Woolen Mills, to Milwaukee Bridge Co.

WESTERN STATES

Eagle, Colo., 250 tons, State highway bridge, to Virginia Bridge & Iron Co.

Ketchum, Idaho, 175 tons, bridge, to American Bridge Co.

Los Angeles, 458 tons, Soto Street bridge over Ramona Boulevard, to McClintic-Marshall Corpn.

Seattle, 325 tons, six bridges for Alaska Road Commission, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New York, 8000 tons, Manhattan West Side Elevated Highway; Poirier McLane Corpn., N. Y., low bidder.

Syracuse, N. Y., 12,000 tons, 26 bridges for grade separation work to be financed jointly by New York Central Railroad and State of New York; bids Dec. 4.

Avon, N. Y., 400 tons, highway bridge; bids Nov. 10.

Buffalo, 1400 tons, Kensington high school; bids Dec. 20.

Wilmington, Del., 1500 tons high school; bids Nov. 15.

Pittsburgh, 4000 tons, Montgomery Island dam; bids to be taken by United States Engineers Office.

SOUTH AND SOUTHWEST

Waydesboro, N. C., 290 tons, State highway bridge.

Fort Bragg, N. C., 450 tons, hangar.

State of Georgia, 510 tons, highway bridges.

Oklahoma City, 200 tons, building for Progress Brewing Co.

Luling, La., 250 tons, highway bridge.

Fort Bliss, Tex., 250 tons. Officers' quarters.

Winchell, Tex., 225 tons, bridge.

Beaumont, Tex., 1250 tons, soda ash plant.

Las Vegas, N. M., 160 tons, State highway bridge.

CENTRAL STATES

State of Ohio, 105 tons, Williams and Seneca County bridges; bids Nov. 10.

State of Ohio, 200 tons, bridges in Carroll, Claremont and Columbia Counties; bids Nov. 17.

State of Ohio, 206 tons, highway bridges.

Chicago, tonnage being estimated, 18 postal substations.

Manteno, Ill., tonnage being estimated, state hospital.

Port Washington, Wis., 1000 tons sheet piling; Great Lakes Dredge & Dock Co., general contractor.

WESTERN STATES

Boulder City, Nev., 250 tons, crane girders for Boulder Dam.

Arapahoe County, Colo., 143 tons, State highway bridge; bids Nov. 14.

Douglas County, Ore., 375 tons, State bridge over South Umpqua River; bids Nov. 15.

State of Oregon, 250 tons, bridge.

Oakland, Cal., 1000 tons, Standard Brands building.

Hamilton Field, Cal., 2600 tons, hangars, Robert E. McKee, low bidder on general contract.

Mare Island, Cal., 1200 tons, hangars for Navy Yard; bids Dec. 12.

Mare Island, Cal., 2200 tons, hangars for naval base.

HAWAII

Pearl Harbor, 125 tons sheet piling, pier and quay walls; bids Nov. 15.

FABRICATED PLATE

AWARDS

Clinton, Md., 2200 tons, gas holder for Prince George Gas Corpn., to Bartlett Hayward Co.

Wildwood, N. J., 150 tons, standpipe, to Tippett & Wood, Phillipsburg, N. J.

Anderson, Ind., 100 tons, brewery tanks to an unnamed bidder.

NEW PROJECTS

Cleveland, 1200 to 2400 tons, two or four four barges for Standard Oil Co.

Milwaukee, 1000 tons, tanks and heads for Miller Brewery.

Los Angeles, 2500 tons, liner plates for Metropolitan Water District; bids Nov. 14.

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Wife—But, Jimmy—about this "Whose got it" business, I was reading an ad in your magazine—
Wife—That's the name—Ryerson—and no more worries. And now, my Jimmy, you will take me—
Purch. Agent—Don't worry your pretty head about it, Sweetheart. The chief agreed yesterday on changing to Ryerson. We can depend on them.
RYERSON STEEL - SERVICE
JOSEPH T. RYERSON & SON INC.

Sept. Iron and Steel Imports at High Level

Exports of Iron and Steel from the United States
(In Gross Tons)

	September		Nine Months Ended September	
	1933	1932	1933	1932
Pig iron	152	54	1,859	1,918
Ferromanganese	16	6	27	26
Scrap	40,536	5,998	513,587	158,162
Pig iron, ferroalloys and scrap	*40,704*	*6,058*	*515,473*	*160,106*
Ingots, blooms, billets, sheet bar	448	143	2,051	1,409
Skelp	4,821	212	14,235	17,006
Wire rods	428	2,313	8,960	12,115
Semi-finished steel	*5,697*	*2,668*	*25,246*	*30,530*
Steel bars	1,559	978	14,798	11,793
Alloy steel bars	150	72	1,024	1,312
Iron bars	50	28	397	528
Plates, iron and steel	2,461	445	7,205	8,668
Sheets, galvanized steel	12,241	1,964	33,258	18,689
Sheets, galvanized iron	39	139	662	1,098
Sheets, black steel	4,638	3,449	22,267	30,959
Sheets, black iron	235	160	1,566	2,123
Hoops, bands, strip steel	1,729	1,043	14,983	14,449
Tin plate; terne plate	7,490	5,100	45,172	29,551
Structural shapes, plain material	2,077	993	9,764	12,530
Structural material, fabricated	1,723	1,506	10,475	12,959
Tanks, steel	287	336	1,833	1,892
Steel rails	6,277	864	17,905	10,128
Rail fastenings, switches, frogs, etc	686	192	3,559	3,172
Boiler tubes	543	231	3,011	2,642
Casing and oil-line pipe	3,771	2,221	22,014	14,708
Pipe, black and galvanized, welded steel	3,765	2,868	22,940	20,713
Pipe, black and galvanized, welded iron	96	338	1,031	3,143
Plain wire	2,847	491	12,304	6,685
Barbed wire and woven wire fencing	3,283	1,367	20,526	14,080
Wire cloth and screening	70	44	514	488
Wire rope	135	104	1,353	1,147
Wire nails	1,050	456	7,320	5,775
Other nails and tacks	399	211	2,969	2,622
Horseshoes	5	3	109	60
Bolts, nuts, rivets and washers, except track	327	223	2,328	2,002
Rolled and finished steel	*57,933*	*25,826*	*281,287*	*233,916*
Cast iron pipe and fittings	2,674	495	9,075	6,386
Malleable iron screwed fittings	220	141	1,591	1,290
Car wheels and axles	288	69	3,013	2,089
Iron castings	591	200	2,414	1,813
Steel castings	21	52	602	1,018
Forgings	352	324	2,248	3,060
Castings and forgings	*4,146*	*1,281*	*18,943*	*15,656*
All other	319	201	2,803	3,063
Total	108,799	36,034	843,752	443,271

Imports of Iron and Steel Products into the United States
(In Gross Tons)

	September		Nine Months Ended September	
	1933	1932	1933	1932
Pig iron	19,745	17,250	119,399	90,324
Sponge iron	145	6	517	107
Ferromanganese and spiegeleisen*	8,408	1,163	39,996	17,132
Ferrochrome†	3	....	24	133
Ferrosilicon‡	309	....	419	44
Other ferroalloys	....	....	102	672
Scrap	13,927	4,390	46,310	9,552
Pig iron, ferroalloys and scrap	*42,537*	*12,809*	*206,767*	*117,964*
Steel ingots, blooms, etc	126	91	618	2,186
Wire rods	693	862	9,685	5,447
Semi-finished steel	*819*	*953*	*10,303*	*7,633*
Concrete reinforcing bars	147	1,181	1,953	23,129
Hollow steel bars	108	125	679	689
Merchant steel bars	2,559	1,193	14,558	24,127
Iron bars	16	38	312	421
Iron slabs	....	....	1	11
Boiler and other plate	34	33	191	376
Sheets, skelp and saw plate	515	1,817	7,257	14,562
Tin plate	10	5	221	7,215
Structural shapes	3,161	3,109	21,161	24,249
Sheet piling	....	....	94	1
Rails and rail fastenings	35	2,524	4,616	4,916
Welded pipe	1,035	239	3,554	3,468
Other pipe	366	190	1,388	2,106
Barbed wire	434	748	6,216	11,195
Round iron and steel wire	171	107	2,235	1,526
Flat wire and strip steel	143	88	832	1,191
Wire rope and strand	144	132	1,205	1,335
Other wire	108	48	1,301	737
Hoops and bands	2,461	3,062	15,996	24,558
Nails, tacks and staples	712	762	4,798	7,747
Bolts, nuts and rivets	3	12	182	148
Other finished steel	17	26	295	95
Rolled and finished steel	*12,179*	*15,439*	*89,045*	*153,802*
Cast iron pipe and fittings	....	....	724	199
Castings and forgings	171	29	989	796
Total	55,706	29,230	307,828	280,394

*Manganese content only.
†Chromium content only.
‡Silicon content only.

WASHINGTON, Nov. 3.—Increasing 8867 gross tons, imports of iron and steel into the United States in September totaled 55,706 tons compared with 46,839 tons in August. Canada led by far as the source of incoming shipments, supplying 23,708 tons, of which 6425 tons consisted of pig iron, 13,810 tons of scrap, and 2160 tons of ferromanganese and spiegeleisen. Ranking second was India, which supplied 7236 tons, all of which was pig iron, total imports of which amounted to 19,745 tons. Norway supplied 6055 tons, of which 5850 tons was ferromanganese and spiegeleisen. Belgian shipments, aggregating 5995 tons, consisted largely of merchant steel bars, 1398 tons; structural shapes, 1964 tons and hoops and bands, 1594 tons. Of the 5776 tons furnished by Norway, 5737 tons was pig iron.

Exports in September were 10,575 tons smaller than in August. This resulted from a decline of 29,609 tons in the shipments of scrap to overseas purchasers—and to the cumulative weight of thirty-five other instances of reduced shipments, none of which, however, were in significant amount. On the other hand there were twenty-five increases, among which were galvanized steel sheets (9150 tons), heavy rails (3675 tons), skelp (3637 tons), cast iron pressure pipe and fittings (1741 tons), black steel sheets (1693 tons). Other plate not fabricated (1468 tons), welded casing and oil line pipe (1134 tons), and seamless casing and oil line pipe (1030 tons).

Sources of American Imports of Iron Ore
(In Gross Tons)

	September		Nine Months Ended September	
	1933	1932	1933	1932
Canada	45	....	45	807
Cuba	22,000	11,000	143,150	66,000
Chile	96,608	....	226,520	218,492
Spain	....	....	606	245
Sweden	....	....	....	7,037
French Africa	....	....	....	10,000
Russia	17,240	7,810	84,090	130,670
Other countries	200	....	57,077	84,942
Total	136,093	18,810	511,488	518,193

United States Imports of Pig Iron by Countries of Shipment
(In Gross Tons)

	September		Nine Months Ended September	
	1933	1932	1933	1932
United Kingdom	....	40	5,140	16,442
British India	7,236	1,059	48,195	25,003
Germany	....	50	234	225
Netherlands	5,737	6,043	48,720	42,444
Canada	6,425	59	10,844	197
France	....	....	....	....
Belgium	....	....	....	200
Norway	100	2	702	202
Sweden	....	....	2,980	5,131
All others	347	....	2,584	480
Total	19,745	7,253	119,399	90,324

Tin Consumers Buy Moderately Heavy as Sterling Strength Forces Prices Upward

Zinc Concentrates and Spelter Drop to Lower Price Levels—Copper Trading Hampered by Code Uncertainties—Lead Quiet

NEW YORK, Nov. 8.—Copper consumers were showing signs of returning confidence, but recent code developments and an uncertain market position have again resulted in extreme buying caution. Mine producers continue to maintain their nominal price position of 9c. a lb., and custom smelters and outside interests are currently making scattered sales at a fairly stable price of 8c. a lb., delivered Connecticut Valley. The interest of the trade is held by the attempts to devise a code satisfactory to the trade. The industry's code committee is expected to present a revised code to Deputy Administrator King during the week. In all probability a minimum price will be set, but heavy opposition met the suggestions of priority on sales to fabricators, and the limiting of scrap intakes of custom smelters or ore conversion of mine producers. What the final code will contain is still highly problematical. It is expected that the projected electrification program of the Pennsylvania Railroad or the work at Muscle Shoals will not materially affect the statistical position of copper, inasmuch as most of the supplies for the work have already been bought. Bookings from European fabricators continue in good volume at prices spreading from 7.90c. to 8c. a lb., c.i.f. usual Continental ports. The parity of prices here and abroad is expected to result in a movement downward there or stronger quotations here.

Tin

As Straits and refined grades approached 50c. a lb., New York, with stronger sterling, consumers hastened to make sizable commitments. Sterling reached its war-time level of $4.95½ today, and Straits was available in New York at 51.37½c., the highest market price in more than four years. Considerable uncertainty prevails as to how the Government will manipulate exchange values, and tin buyers generally avoided active market participation as quotations passed 50c. Consumers are indicating more interest in first quarter deliveries, and some business is being done in that direction. October stock shipments of 2663 tons cut the world's visible supply to 31,666 tons, the lowest level since 1929. United States withdrawals in October totaled 6035 tons, against 5105 tons in September.

Zinc

The contraction of consumer interest in spelter, following the recent artificial bulge in bookings, resulted in shaded prices as several first hands attempted to attract tonnage to their books. Prices dropped during the week in easy stages to the present position of 4.50c. a lb., East St. Louis, and 4.85c., New York. January metal is available, but consumers are definitely uninclined to consider positions that far ahead. Sales last week approached 1500 tons, mostly at 4.75c., although some of the more recent tonnage was booked at 4.50c. Sellers are generally inclined to maintain their present price position until prices for ore replacements become more predictable. Galvanizers are less active, and the Tri-State ore policy is uncertain, resulting in an unsteady market position for Prime Western. Consumers perceive no inducement to make commitments, and speculators are avoiding participation in the present market. Joplin ore sales totaled 4300 tons last week, which about balanced the further reduced output. Despite curtailment of operations all grades of concentrates dropped sharply to $28.50 a ton during the week, but major first hands contend that they cannot profitably convert ore at this price with refined spelter selling at 4.15c. a lb.

Lead

Commitments aggregating 14,000 tons, made during the recent price advance, established consumers in a comfortable position, and current trading has contracted to a comparatively quiet level. Major producers are occasionally disposing of daily ore intake, and quotations are fully maintained in all directions at 4.15c. a lb., St. Louis, and 4.30c., New York, for positions through November and into December. Domestic prices are considered fairly steady, although attractive business could probably develop moderate shading in several directions. The prevailing high sterling position has definitely removed all threat of importation of foreign pig lead. The buying wave instigated by the Governmental foreign gold policy has definitely subsided, the only current reaction being improved Continental sales by representatives of American interests.

The Week's Prices. Cents Per Pound for Early Delivery

	Nov. 1	Nov. 2	Nov. 3	Nov. 4	Nov. 6	Nov. 8
Electrolytic copper, N. Y.*	7.75	7.75	7.75	7.75	7.75	7.75
Lake copper, New York	8.00	8.00	8.00	8.00	8.00	8.00
Straits tin, Spot, N. Y.	49.12½	49.87½	49.90	....	50.00	51.37½
Zinc, East St. Louis	4.75	4.65	4.50	4.50	4.50	4.50
Zinc, New York	5.10	5.00	4.85	4.85	4.85	4.85
Lead, St. Louis	4.15	4.15	4.15	4.15	4.15	4.15
Lead, New York	4.30	4.30	4.30	4.30	4.30	4.30

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.70c. a lb., New York.
Brass ingots, 85-5-5-5, 8.50c a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	52.50c. to 53.50c.
Tin, bar	54.50c. to 55.50c.
Copper, Lake	9.25c. to 10.00c.
Copper, electrolytic	9.00c. to 9.50c.
Copper, castings	8.75c. to 9.75c.
*Copper sheets, hot-rolled	17.12½c.
*High brass sheets	14.75c.
*Seamless brass tubes	16.37½c.
*Seamless copper tubes	16.62½c.
*Brass rods	12.25c.
Zinc, slabs	6.00c. to 7.00c.
Zinc sheets (No. 9), casks	9.75c. to 10.00c.
Lead, American pig	5.12½c. to 6.12½c.
Lead, bar	6.12½c. to 7.12½c.
Lead, sheets	8.00c.
Antimony, Asiatic	8.50c. to 9.50c.
Alum., virgin, 99 per cent plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal, commercial grade	25.00c. to 50.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	53.00c.
Tin, bar	55.00c.
Copper, Lake	9.50c. to 9.625c.
Copper, electrolytic	9.50c. to 9.625c.
Copper, castings	9.25c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	5.00c. to 5.25c.
Lead, bar	8.00c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	58.50c.
Solder, ½ and ½	32.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.75c.	7.50c.
Copper, hvy. and wire	5.75c.	7.25c.
Copper, light and bottoms	5.00c.	5.75c.
Brass, heavy	3.50c.	4.00c.
Brass, light	3.00c.	3.50c.
Hvy. machine composition	4.50c.	5.25c.
No. 1 yel. brass turnings	4.25c.	5.00c.
No. 1 red brass or compos. turnings	4.00c.	4.75c.
Lead, heavy	3.25c.	3.625c.
Zinc	2.75c.	3.25c.
Cast aluminum	7.25c.	8.50c.
Sheet aluminum	11.25c.	12.75c.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.75c.
F.o.b. Chicago or Gary	1.80c.
Del'd Philadelphia	2.04c.
Del'd New York	2.08c.
F.o.b. Cleveland	1.80c.
F.o.b. Buffalo	1.85c.
F.o.b. Birmingham	1.90c.
F.o.b. cars dock Pacific ports	2.30c.
F.o.b. cars dock Gulf ports	2.15c.

Rail Steel
(For merchant trade)

F.o.b. Cleveland	1.70c.
F.o.b. Chicago	1.70c.
F.o.b. Gary	1.70c.
F.o.b. Pittsburgh	1.65c.
F.o.b. Buffalo	1.75c.
F.o.b. Birmingham	1.80c.

Billet Steel Reinforcing
(Stock lengths as quoted by distributers; cutting to length, 60 in. and over takes extra of 10c. per 100 lb.)

F.o.b. P'gh mills	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. Buffalo	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Youngstown	1.85c.
F.o.b. Chicago or Gary	1.85c.
F.o.b. cars dock Pacific ports	2.35c.
F.o.b. cars dock Gulf ports	2.20c.

Rail Steel Reinforcing
(Cut lengths as quoted by distributers)

F.o.b. Pittsburgh	1.75c.
F.o.b. Cleveland	1.80c.
F.o.b. Chicago	1.80c.

Iron

Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.74c.
Common iron del'd New York	1.90c.

Steel Car Axles

F.o.b. Pittsburgh	2.50c.
F.o.b. Chicago	2.50c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Birmingham	1.85c.
Del'd Cleveland	1.885c.
Del'd Philadelphia	1.885c.
F.o.b. Coatesville	1.80c.
F.o.b. Sparrows Point	1.80c.
Del'd New York	1.98c.
F.o.b. dock cars Pacific ports	2.25c.
F.o.b. cars dock, Gulf ports	2.10c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Floor Plates

F.o.b. Pittsburgh	3.20c.
F.o.b. Chicago	3.25c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.
F.o.b. Buffalo	1.80c.
F.o.b. Bethlehem	1.80c.
Del'd Cleveland	1.885c.
Del'd Philadelphia	1.905c.
Del'd New York	1.9525c.
F.o.b. cars dock, Gulf ports	2.10c.
F.o.b. dock cars Pacific ports (standard)	2.25c.
F.o.b. dock cars Pacific ports (wide flange)	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.00c.
F.o.b. Chicago mill	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base, 2.45c. a lb. except at Bethlehem where the price is 2.55c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2000 (½% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Cold Finished Bars*

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	1.95c.
Bars, f.o.b. Chicago	2c.
Bars, Cleveland	2c.
Bars, Buffalo	2c.
Bars, Detroit	2.15c.
Bars, eastern Michigan	2.20c.
Precision round bars, Pittsburgh	2.15c.
Precision round bars, Cleveland	2.20c.
Precision round bars (alloy), Pitts.	2.85c.
Shafting, ground, f.o.b. mill, 1¼ in.	3.25c.
1-3/16 to 1½ in.	2.75c.
1-9/16 to 1⅞ in.	2.60c.
1-15/16 to 2⅞ in.	2.45c.
2-15/16 to 6 in.	2.30c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.75c.
No. 10, f.o.b. Gary	1.85c.
No. 10, del'd Phila.	2.04c.
No. 10, f.o.b. Birmingham	1.90c.
No. 10, f.o.b. dock cars Pacific ports	2.42½c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.25c.
No. 24, f.o.b. Gary	2.35c.
No. 24, del'd Phila.	2.54c.
No. 24, f.o.b. Birmingham	2.40c.
No. 24, f.o.b. dock cars Pacific ports	2.95c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.30c.
No. 10 gage, f.o.b. Gary	2.40c.
No. 10 gage, del'd Phila.	2.59c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.00c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.75c.
No. 20 gage, f.o.b. Gary	2.85c.
No. 20 gage, del'd Phila.	3.04c.
No. 20 gage, f.o.b. dock cars Pacific ports	4.45c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Gary	2.95c.
No. 24, del'd Phila.	3.14c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, f.o.b. dock cars Pacific ports	3.55c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Terne

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	2.90c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	2.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.50c.
No. 28, Gary	2.60c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$4.65
Standard cokes, f.o.b. Gary	4.75

Terne Plate
(P.o.b. Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$8.70
15-lb. coating I.C.	11.00
20-lb. coating I.C.	11.90
25-lb. coating I.C.	13.00
30-lb. coating I.C.	13.80
40-lb. coating I.C.	15.30

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh.	1.75c.
All widths up to 24 in., Chicago	1.85c.
Cooperage stock, Pittsburgh	1.85c.
Cooperage stock, Chicago	1.95c.

Cold-Rolled Strips

F.o.b. Pittsburgh	2.40c.
F.o.b. Cleveland	2.40c.
Del'd Chicago	2.68c.
F.o.b. Worcester	2.60c.

Fender Stock

No. 20, Pittsburgh or Cleveland	3.10c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

	Per Lb.
Bright wire	2.10c.
Spring wire	3.10c.

To Jobbing Trade

Extras of 10c. a 100 lb. on joint carloads and 30c. on pooled cars and less-than-carload lots are applied on all merchant wire products. An allowance of $2 a ton is made to jobbers on straight, mixed or joint carloads; $3 a ton is allowed on less-than-carload shipments.

	Base per Keg
Standard wire nails	$2.10
Smooth coated nails	2.10
Galvanized nails	3.60

	Base per 100 Lb.
Smooth annealed wire	$2.25
Smooth galvanized wire	2.60
Polished staples	2.80
Galvanized staples	3.05
Barbed wire, galvanized	2.60
Woven wire fence, base column	55.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

Butt Weld

Steel Inches	Black	Galv.	Wrought Iron Inches	Black	Galv.
⅛	51½	29½	⅛	+91½	+138
¼ to ⅜	57	38½	¼ & ⅜	+11½	+21½
½	62	50½	½	31½	15
¾	65¼	55½	¾	36½	20½
1 to 3	67½	58½	1&1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	63½	54½	2	37	22½
2½ to 3	66½	57½	2½ to 3½	38	25
3½ to 6	68¼	59½	4 to 8	40	28½
7 and 8	67½	57½	9 to 12	38	24½
9 and 10	67	57			
11 and 12	66	56			

Butt Weld, extra strong, plain ends

¼	48½	33½	¼	+13	+45½
⅜ to ¾	54½	41½	⅜ & ½	+2½	+34½
½	60	51	¾	32¼	17½
¾	64½	55½	⅞	37½	22½
1 to 3	66½	58½	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	61½	53½	2	40	26
2½ to 3	65½	57½	2½ to 4	45½	33
3½ to 6	69	61	4½ to 6	45	32½
7 and 8	68	58	7 & 8	46	33
9 and 10	67	57	9 to 12	41½	30
11 and 12	66	56			

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	33	1½ in.	1
2½ in.—2⅝ in.	40	1¾ in.	8
3 in.	47	2 in.—2¼ in.	13
3¼ in.—4½ in.	50	2½ in.—2¾ in.	16
4 in.	52	3 in.	17
4½ in. to 6 in.	42	3¼ in. to 3½ in	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold-Drawn

1 in.	61	3 in.	41
1¼ to 1½ in.	53	3¼ to 3½ in.	44
1¾ in.	37	4 in.	46
2 to 2¼ in.	27	4½, 5 and 6 in	36
2½ to 2⅝ in.	34		

Hot-Rolled

2 and 2¼ in.	33	3¼ to 3½ in.	50
2½ and 2¾ in.	40	4 in.	52
3 in.	47	4½, 5 and 6 in.	42

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	
Carbon, 0.30% to 40% base	

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, 60-lb. and heavier, per gross ton	$36.37½
Angle bars, per 100 lb.	2.35

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$32.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates, steel	1.90
Track bolts, to steam railroads	3.40
Track bolts, to jobbers, all sizes (per 100 count)	70 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex nuts, blank or tapped	70
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh.	72½, 25 and 10
Stove bolts in packages, Ch'go.	72½, 25 and 10
Stove bolts in packages, Cleveland.	72½, 25 and 10
Stove bolts in bulk, P'gh.	80
Stove bolts in bulk, Chicago	80
Stove bolts in bulk, Cleveland	80
Tire bolts	60

Large Rivets
(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago and Birmingham	2.85

Small Rivets
(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago and Birm'g'm	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screw, 1 in. dia. and smaller	80
Milled standard set screws, case hardened, 1 in. dia. and smaller	80
Milled headless set screws, cut thread ⅜ in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85 and 10
Upset set screws, sq. head	80
Milled studs	70

STAINLESS STEEL

(Max. 16% Cr, 6% Ni, 0.15% C)
(Base Prices, f.o.b. Pittsburgh)

	Per Lb.
Bars	20½c.
Plates	24c.
No. 20 gage cold-rolled sheets	30c.
Hot-rolled strip	19½c.
Cold-rolled strip, 0.100 or over	25c.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Youngstown, Chicago, Gary, Buffalo, Cleveland, Birmingham.

	Per Gross Ton
Rerolling	$26.00
Forging quality	$1.00

Sheet Bars

F.o.b. Pittsburgh, Youngstown, Cleveland, Chicago, Buffalo, Canton, Sparrows Point.

	Per Gross Ton
Open-hearth or Bessemer	$26.00

Skelp

F.o.b. Pittsburgh, Youngstown, Chicago, Buffalo, Coatesville, Pa., or Sparrows Point, Md.

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00
Birmingham	38.00
Youngstown (del'd)	36.00

ALLOY STEEL BLOOMS, BILLETS AND SLABS

F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem.

Base price, $49 a gross ton except at Bethlehem, where it is $51.

CARBON STEEL FORGING INGOTS

F.o.b. Pittsburgh, Youngstown or Chicago.

Uncropped, $28 per gross ton.

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.75
Foundry, f.o.b. Connellsville Prompt	$4.25 to 5.25
Foundry, by-product, Chicago ovens, for delivery outside switching districts	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	10.50
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	8.50
Foundry, by-product, Cleveland delivered	9.27
Foundry, Birmingham	4.75
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.55 to $1.80
Mine run coking coal f.o.b. W. Pa.	1.80 to 2.00
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.30
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.20
Steam slack, f.o.b. W. Pa. mines	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines	1.65 to 1.85

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.73c.
No. 5 industrial fuel oil	3.23c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.50c.
No. 4 industrial	5.35c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works: High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Chrome Brick

	Per Net Ton
Standard size	$45.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$65.00
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$43.00 to $44.00
4-in., del'd Chicago	46.00 to 47.00
6-in., and larger, del'd New York	43.00
4-in., del'd New York	46.00
6-in., and larger, Birmingham,	$35.00 to 36.00
4-in., Birmingham	38.00 to 39.00

Class "A" and gas pipe, $3 extra.

Pig Iron, Ores, Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$18.00	$18.50	$17.50	$19.00
Bethlehem, Pa.	17.50	18.00	17.00	18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Buffalo	17.50	18.00	16.50	18.50
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	....
Duluth, Minn.	18.00	18.00	....	18.50
Birmingham	13.50	....	12.50	....
Provo, Utah	16.50	....	....	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	$18.50	$19.00	$18.00	$19.50
From Buffalo	18.50	19.00	18.00	19.50
Brooklyn				
From East. Pa. or Buffalo	19.77	20.27	19.27	20.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	18.89	19.39	18.39	19.89
Philadelphia				
From Eastern Pa.	18.26	18.76	17.76	19.26
Cincinnati				
From Hamilton, Ohio	18.51	18.51	18.01	19.01
Canton, Ohio				
From Cleveland and Youngstown	18.76	18.76	....	....
Columbus, Ohio				
From Hamilton, Ohio	19.50	19.50	....	....
Mansfield, Ohio				
From Cleveland and Toledo	19.26	19.26	....	....
Indianapolis				
From Hamilton, Ohio	19.77	19.77	....	....
South Bend, Ind.				
From Chicago	19.55	19.55	....	....
Milwaukee				
From Chicago	18.50	18.50	....	....
St. Paul				
From Duluth	19.44	....	....	....
Davenport, Iowa				
From Chicago	19.26	19.26	....	....
Kansas City				
From Granite City	20.04	20.54	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$22.00
Johnson City, Tenn.	22.00
F.o.b. Valley furnace	22.00
Del'd Chicago	27.65

GRAY FORGE PIG IRON

Valley furnace	$17.50

CHARCOAL PIG IRON

Lake Superior furnace	$20.50
Delivered Chicago	23.54
Delivered Buffalo	23.78

CANADA

Pig Iron

Per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard, (carload)	$82.00
Domestic, 80%, seaboard, (less carloads)	89.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$27.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid)	31.06
14% to 16% (less carloads)	38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$22.25	12%	$29.25
7%	23.25	13%	30.75
8%	24.25	14%	32.25
9%	25.25	15%	33.75
10%	26.25	16%	35.25
11%	27.75	17%	36.75

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$27.25	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	94c.
Ferrotungsten, less carloads	$1.00
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrochromium, 2% carbon	16.50 to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del., per lb. contained Va.	$2.60 to $2.80
Ferrocarbontitanium, 15 to 18% per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorous, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.5% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorous, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c.
Iron, low phos., Swedish, average 68½% iron	8.50c.
Iron, basic or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, aver. 65% iron (nom.)	8c.
Manganese, Caucasian, washed 52%	22c.
Manganese, African, Indian, 44-48%	20c.
Manganese, African, Indian, 49-51%	21c.
Manganese, Brazilian, 46 to 48½	17c.

	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid*	$12.00
Tungsten, domestic scheelite*	$11.00 to $12.00

	Per Gross Ton
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	16.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sales.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines	$15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	18.50
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$11.25 to $11.75
No. 2 heavy melting steel	10.25 to 10.75
No. 2 railroad wrought	11.25 to 11.75
Scrap rails	11.25 to 11.75
Rails 3 ft. and under	14.00 to 14.50
Sheet car crops, ordinary	13.00 to 13.50
Compressed sheet steel	11.25 to 11.75
Hand bundled sheet steel	10.25 to 10.75
Hvy. steel axle turnings	10.25 to 10.75
Machine shop turnings	8.00 to 8.50
Short shov. steel turnings	8.00 to 8.50
Short mixed borings and turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Cast iron carwheels	11.00 to 11.50
Heavy breakable cast	10.50 to 11.00
No. 1 cast	11.00 to 11.50
Railr. knuckles and couplers	13.00 to 13.50
Rail. coil and leaf springs	13.00 to 13.50
Rolled steel wheels	13.00 to 13.50
Low phos. billet crops	15.00 to 15.50
Low phos. sheet bar crops	14.50 to 15.00
Low phos. plate scrap	14.00 to 14.50
Low phos. punchings	14.50 to 15.00
Steel car axles	13.50 to 14.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$8.50 to $9.00
Shoveling steel	8.50 to 9.00
Hydraulic comp. sheets	$7.25 to $7.75
Drop forge flashings	6.50 to 7.00
No. 1 busheling	7.00 to 7.50
Rolled carwheels	9.50 to 10.00
Railroad tires	10.00 to 10.50
Railroad leaf springs	10.00 to 10.50
Axle turnings	7.50 to 8.00
Steel couplers and knuckles	9.50 to 10.00
Coil springs	10.50 to 11.00
Axle turnings (elec. fur.)	7.50 to 8.00
Low phos. punchings	10.50 to 11.00
Low phos. plates, 12 in. and under	10.50 to 11.00
Cast iron borings	5.00 to 5.50
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	5.00 to 5.50
Rerolling rails	10.00 to 10.50
Steel rails, less than 3 ft.	10.50 to 11.00
Steel rails, less than 2 ft.	11.00 to 11.50
Angle bars, steel	9.50 to 10.00
Cast iron carwheels	9.50 to 10.00
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00

	Per Net Ton
Iron car axles	$11.00 to $11.50
Steel car axles	9.50 to 10.00
No. 1 railroad wrought	7.25 to 7.75
No. 2 railroad wrought	7.50 to 8.00

No. 2 busheling	$3.50 to	$4.00
Locomotive tires, smooth	8.50 to	9.00
Pipe and flues	4.25 to	4.75
No. 1 machinery cast	8.50 to	9.00
Clean automobile cast	8.50 to	9.00
No. 1 railroad cast	7.50 to	8.00
No. 1 agricultural cast	7.50 to	8.00
Stove plate	6.25 to	6.75
Grate bars	6.00 to	6.50
Brake shoes	8.00 to	8.50

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$9.50 to	$10.00
No. 2 heavy melting steel	8.00 to	8.50
No. 1 railroad wrought	....	11.00
Bundled sheets	8.00 to	8.50
Hydraulic compressed, new	9.50 to	10.00
Hydraulic compressed, old	8.00 to	8.50
Machine shop turnings	6.00 to	6.50
Heavy axle turnings	....	9.00
Cast borings	6.00 to	6.50
Heavy breakable cast	9.50 to	10.00
Stove plate (steel works)	....	8.50
No. 1 low phos. heavy	13.00 to	14.00
Couplers and knuckles	12.00 to	12.50
Rolled steel wheels	12.00 to	12.50
No. 1 blast furnace	6.00 to	6.50
Spec. iron and steel pipe	8.50 to	9.00
Shafting	14.50 to	15.00
Steel axles	13.50 to	14.00
No. 1 forge fire	....	10.00
Cast iron car wheels	10.50 to	11.00
No. 1 cast	11.00 to	11.50
Cast borings (chem.)	12.00 to	14.00
Steel rails for rolling	12.00 to	12.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$9.50 to	$10.00
No. 2 heavy melting steel	9.00 to	9.50
Compressed sheet steel	9.00 to	9.50
Light bundled sheet stampings	6.50 to	7.00
Drop forge flashings	9.00 to	9.50
Machine shop turnings	7.00 to	7.50
Short shoveling turnings	7.50 to	8.00
No. 1 busheling	9.00 to	9.50
Steel axle turnings	7.50 to	8.00
Low phos. billet crops	12.50 to	13.00
Cast iron borings	7.00 to	7.50
Mixed borings and short turnings	7.00 to	7.50
No. 2 busheling	7.00 to	7.50
No. 1 cast	11.00 to	11.50
Railroad grate bars	6.50 to	7.00
Stove plate	7.50 to	8.00
Rails under 3 ft.	10.00 to	10.50
Rails for rolling	10.50 to	11.00
Railroad malleable	10.00 to	10.50
Cast iron carwheels	....	11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$9.00 to	$9.50
No. 2 heavy melting scrap	8.00 to	8.50
Scrap rails	8.50 to	9.00
New hydraul. comp. sheets	8.00 to	8.50
Old hydraul. comp. sheets	7.00 to	7.50
Drop forge flashings	8.00 to	8.50
No. 1 busheling	8.00 to	8.50
Hvy. steel axle turnings	8.50 to	9.00
Machine shop turnings	6.00 to	6.50
Knuckles and couplers	11.00 to	11.50
Coil and leaf springs	11.00 to	11.50
Rolled steel wheels	11.00 to	11.50
Low phos. billet crops	12.50 to	13.00
Short shov. steel turnings	7.00 to	7.50
Short mixed borings and turnings	6.00 to	6.50
Cast iron borings	6.00 to	6.50
No. 2 busheling	6.00 to	6.50
Steel car axles	11.00 to	12.00
Iron axles	11.00 to	12.00
No. 1 machinery cast	11.00 to	11.50
No. 1 cupola cast	11.00 to	11.50
Stove plate	8.75 to	9.25
Steel rails, 3 ft. and under	12.50 to	13.00
Cast iron carwheels	10.00 to	10.50
Industrial malleable	10.50 to	11.00
Railroad malleable	10.50 to	11.00
Chemical borings	9.00 to	10.00

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$10.00 to	$10.50
Scrap steel rails	9.00 to	9.50
Short shoveling turnings	....	5.50
Stove plate	7.00 to	7.50
Steel axles	11.00 to	11.50
Iron axles	11.00 to	11.50
No. 1 railroad wrought	....	7.00
Rails for rolling	....	10.50
No. 1 cast	9.50 to	10.00
Tramcar wheels	9.50 to	10.00
Cast iron borings, chem.	....	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$8.50 to	$9.00
No. 1 heavy melting	7.50 to	8.00
No. 2 heavy melting	7.00 to	7.50
No. 1 locomotive tires	8.00 to	8.50
Misc. stand.-sec. rails	9.00 to	9.50
Railroad springs	9.00 to	9.50
Bundled sheets	6.00 to	6.50
No. 2 railroad wrought	7.50 to	8.00
No. 1 busheling	6.50 to	7.00
Cast iron borings and shoveling turnings	4.50 to	5.00
Rails for rolling	9.25 to	9.75
Machine shop turnings	4.25 to	4.75
Heavy turnings	5.50 to	6.00
Steel car axles	10.00 to	10.50
Iron car axles	12.50 to	13.00
Wrot. iron bars and trans.	9.00 to	9.50
No. 1 railroad wrought	6.25 to	6.75
Steel rails less than 3 ft.	11.00 to	11.50
Steel angle bars	9.00 to	9.50
Cast iron carwheels	6.75 to	7.25
No. 1 machinery cast	8.00 to	8.50
Railroad malleable	8.50 to	9.00
No. 1 railroad cast	8.00 to	8.50
Stove plate	6.50 to	7.00
Relay rails, 60 lb. and under	16.00 to	16.50
Relay, rails, 60 lb. and over	$20.00 to	$21.00
Agricult. malleable	9.00 to	9.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$5.50 to	$6.00
Scrap T rails	5.50 to	6.00
Machine shop turnings	2.50 to	2.75
Cast iron borings	4.00 to	4.25
Bundled skeleton, long	4.75 to	5.00
Forge flashings	4.75 to	5.00
Blast furnace scrap	4.75 to	5.00
Shafting	9.00 to	9.50
Steel car axles	8.50 to	9.00
Wrought pipe	3.50 to	4.00
Rails for rerolling	6.00 to	6.50
Cast iron borings, chemical	7.50 to	8.00

Per gross ton delivered consumers' yards:

Textile cast	$10.00 to	$10.50
No. 1 machinery cast	10.00 to	10.50
Stove plate	6.25 to	6.50
Railroad malleable	11.00 to	12.00

NEW YORK

Dealers' buying prices per gross ton:
Prices in italics for loading on barge; all others for loading on cars.

No. 1 heavy melting steel	$6.50 to	*$7.50*
No. 2 heavy melting steel	5.50 to	*6.50*
Unprepared yard iron and steel	2.50 to	3.00
No. 1 heavy breakable cast	6.00 to	6.50
Machine shop turnings	3.00 to	3.50
Short shoveling turnings	3.00 to	3.50
Cast borings	4.50 to	4.75
No. 1 blast furnace	$2.50 to	$3.00
Steel car axles	10.00 to	10.50
Spec. iron and steel pipe	4.50 to	5.00
Forge fire	5.50 to	6.00
No. 1 railroad wrought	7.50 to	8.00
No. 1 yard wrought, long	6.50 to	7.00
Rails for rolling	8.50 to	9.00
No. 1 cast	7.00 to	7.25
No. 2 cast	6.00 to	6.25
Stove plate	5.50 to	6.00
Cast borings (chemical)	12.00 to	12.50

Per gross ton, delivered local foundries:

No. 1 machinery cast		$8.00
No. 1 hvy. cast (cupola size)		8.00
No. 2 cast		7.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$8.25 to	$8.75
Scrap rails for melting	9.00 to	9.50
Loose sheet clippings	4.75 to	5.25
Bundled sheets	5.75 to	6.25
Cast iron borings	5.75 to	6.25
Machine shop turnings	5.25 to	5.75
No. 1 busheling	6.50 to	7.00
No. 2 busheling	3.25 to	3.75
Rails for rolling	9.25 to	9.75
No. 1 locomotive tires	8.50 to	9.00
Short rails	11.25 to	11.75
Cast iron carwheels	8.00 to	8.50
No. 1 machinery cast	9.50 to	10.00
No. 1 railroad cast	9.00 to	9.50
Burnt cast	6.50 to	7.00
Stove plate	6.50 to	7.00
Agricultural malleable	8.50 to	9.00
Railroad malleable	9.00 to	9.50

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$6.75 to	$7.25
Borings and short turnings	5.75 to	6.25
Long turnings	5.25 to	5.75
No. 1 machinery cast	7.50 to	8.00
Automotive cast	9.50 to	10.00
Hydraul. comp. sheets	6.75 to	7.25
Stove plate	5.75 to	6.25
New factory busheling	5.75 to	6.25
Old No. 2 busheling	4.50 to	5.00
Sheet clippings	4.50 to	5.00
Flashings	5.50 to	6.00
Low phos. plate scrap	7.50 to	8.00

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$5.50	$5.50
Rails, scrap	6.00	4.50
Machine shop turnings	2.50	2.50
Boiler plate	4.50	4.50
Heavy axle turnings	2.50	2.50
Cast borings	3.00	3.00
Steel borings	2.00	2.00
Wrought pipe	2.50	2.50
Steel axles	4.50	6.00
Axles, wrought iron	4.50	6.50
No. 1 machinery cast	7.75	8.00
Stove plate	4.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.85c.
Reinforcing steel bars	3.00c.
Cold-finished and screw stock—	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands, under ¼ in.	3.10c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.50c.
Hot-rolled sheets (No. 10)	2.85c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.32
Spikes, large	2.40c.
Small	2.65c.
Boat	2.90c.

Track bolts, all sizes, per 100 count, 65 per cent off list.

Machine bolts, 100 count, **65 per cent off list.**

Carriage bolts, 100 count, 65 per cent off list.

Nuts, all styles, 100 count, 70 per cent off list.

Large rivets, base per 100 lb.	$3.25
Wire, black, soft ann'l'd, base per 100 lb.	2.90
Wire, galv. soft, base per 100 lb.	3.35
Common wire nails, per keg	2.40
Cement coated nails, per keg	2.40

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 9999 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.25c.
Flats and squares	3.25c.
Bands, 3/16 in. (in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.20c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.30c.
Hot-rolled sheets (No. 10)	2.85c.
Spikes (9/16 in. and lighter)	3.50c.
Track bolts	4.50c.
Rivets, structural (keg lots)	3c.
Rivets, boiler (keg lots)	3.10c.
	Per Cent Off List
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq., tap. or blank	60 and 5
Hot-pressed nuts, hex., tap. or blank	60 and 5
Hex. head and cap screws	85 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotters	60 and 10
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	$5.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.45
Com. wire nails, base per keg	2.70c.
Cement c't'd nails, base per keg	2.70c.

NEW YORK

	Base per Lb.
Plates	3.30c.
Structural shapes	3.27c.
Soft steel bars, small shapes	3.17c.
Iron bars	3.24c.
Iron bars, swed. charcoal, 6.50c. to	7.00c.
Cold-fin. shafting and screw stock;	
Rounds and hexagons	3.79c.
Flats and squares	4.29c.
Cold-roll. strip, soft and quarter hard	4.00c.
Hoops	3.42c.
Bands	3.42c.
Hot-rolled sheets (No. 10)	3.17c.
Hot-rolled ann'l'd sheets (No. 24*)	3.65c.
Galvanized sheets (No. 24*)	4.25c.
Long terne sheets (No. 24)	4.75c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.60c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open hearth spring steel, base	3.75c. to 10.00c.
Common wire nails, base, per keg	$3.00
	Per Cent Off List
Machine bolt, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	60
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.34c.
Bars, soft steel or iron	3.14c.
Cold-fin. rounds, shafting, screw stock	3.59c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Galv. sheets (No. 24)	4.34c.
Hot-rolled sheets (No. 10)	3.19c.
Black corrug. sheets (No. 24)	3.65c.
Galv. corrug. sheets	4.30c.
Structural rivets	3.34c.
Boiler rivets	3.44c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	65
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	
1000 lb. or over	65
200 to 999 lb.	60
100 to 199 lb.	55
Less than 100 lb.	50

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.60c.
*Structural shapes	2.60c.
*Soft steel bars, small shapes, iron bars (except bands)	2.60c.
‡Reinforc. steel bars, sq., twisted and deform.	2.28c.
Cold-finished steel bars	3.58c.
*Steel hoops	3.15c.
*Steel bands, No. 12 to 3/16 in., incl.	2.90c.
Spring steel	5.00c.
†Hot-rolled annealed sheets (No. 24)	3.40c.
†Galvanized sheets (No. 24)	4.00c.
*Hot-rolled annealed sheets (No. 10)	2.75c.
Diam. pat. floor plates, ¼ in.	4.35c.
Swedish iron bars	6.00c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For 5 tons or more, exclusive of cutting charge.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.21c.
Soft steel bars	2.90c.
Reinforc. steel bars	2.00c. to 2.50c.
Cold-finished steel bars	3.25c.
Flat rolled steel under ¼ in.	3.26c.
Cold-finished strip	5.55c.
Hot-rolled annealed sheets (No. 24)	3.76c.
Galvanized sheets (No. 24)	4.36c.
Hot-rolled sheets (No. 10)	3.01c.
Black ann'l'd wire, per 100 lb.	$2.55
No. 9 galv. wire, per 100 lb.	2.90
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.30c.
Bars, soft steel or iron	3.10c.
New billet reinforc. bars	3.10c.
Rail steel reinforc. bars	3.10c.
Hoops and bands, 3/16 in. and lighter	3.35c.
Cold-finished bars	3.55c.
Hot-rolled annealed sheets (No. 24)	3.40c.
Galv. sheets (No. 24)	4.45c.
Hot-rolled sheets (No. 10)	3.10c.
Structural rivets	4.00c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.60
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.80
Chain, 1-in., per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$16.86
4-in.	37.50
Hot-welded steel boiler tubes, 2-in.	15.03
4-in.	34.83

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.20c.
Soft steel bars	2.90c.
Reinforcing bars	1.95c.
Cold-fin. flats and sq. Rounds and hex.	3.25c. 3.25c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.25c.
Galv. sheets (No. 24)	4.00c.
Bands	3.20c.
Hoops	3.25c.
Hot-rolled unannealed sheets	3.10c.
Com. wire nails, base per keg	$3.00
Black wire, base per 100 lb.	3.25

BOSTON

	Per Lb.
*Beams, channels, angles, tees, zees	2.75c.
*H beams and shapes	2.75c.
*Plates—sheared, tank and univ. mill, ¼ in. thick and heavier	2.75c.
*Floor plates, diamond pattern	4.65c.
*Bar and bar shapes (mild steel)	2.65c.
*Bands 3/16 in. thick and No. 12 ga. incl.	3.15c. to 3.65c.
Hoops, No. 14 ga. and lighter	4.90c. to 5.40c.
*Half rounds, half ovals, ovals and bevels	3.90c.
Tire steel, rd. edge 1½ x ½ in. and larger	4.50c.
Smaller sizes	4.75c.
Cold-finished rounds and hexagons	3.75c.
Cold-rolled strip steel	5.25c.
Cold-finished squares and flats	4.00c.
*Blue annealed sheets, No. 10 ga.	2.65c.
One pass cold-rolled sheets No. 24 ga.	3.50c.
Blued stove pipe sheets, No. 24 ga.	3.90c.
Galvanized steel sheets, No. 24 ga.	4.00c.
Lead coated (long ternes) No. 24 ga.	5.00c.

Base prices for 40,000 lb. orders; extras apply for smaller quantities.

PACIFIC COAST

	San Francisco	Los Angeles	Seattle
	Base per Lb.		
Plates, tank and U. M.	3.50c.	3.30c.	3.90c.
Shapes, standard	3.55c.	3.30c.	3.90c.
Wide-flanged beams and columns	3.75c.	3.50c.	4.10c.
Soft steel bars	4.05c.	3.30c.	3.90c.
Reinforcing bars	3.15c.	3.15c.	3.50c.
Hot-rolled annealed sheets (No. 24)	4.25c.	4.05c.	4.75c.
Hot-rolled sheets (No. 10)	3.75c.	3.45c.	4.15c.
Galv. sheets (No. 24)	4.85c.	4.65c.	5.35c.
Struc. rivets, ½ in. and larger	5.75c.	5.75c.	8.25c.
Cold finished steel Rounds	5.95c.	5.85c.	6.00c.
Squares and hexagons	7.20c.	7.10c.	7.25c.
Flats	7.70c.	7.60c.	8.25c.
Common wire nails —base per keg	$2.90	$3.00	$2.90
less carload			

All items subject to differentials for quantity.

The Welding Rod for Arc Welding

(*Concluded from Page* 21)

It is a well-known fact that in melting alloy steel there is a considerable loss of manganese and carbon and the skilled steel maker takes these melting losses into account in charging the furnace. Obviously, if the welding rod and the parent metal are of the same composition, the deposited metal will most likely be of inferior quality. Some of the welding rod manufacturers anticipate these losses by incorporating sufficient alloy ingredients in the coating. With the use of alloy coated welding rods, the welder is thereby able definitely to control his weld and deposit the best composition of high-manganese steel.

Test Bar	Yield Pt. Lb./ Sq. In.	Ultimate Tensile Str. Lb. / Sq. In.	Per Cent Elong. in 2 in.	Per Cent Reduct. of Area	Spec. Gravity	Brinell Hardness
No. 1	46,300	58,000	6	16	7.51	179
No. 2	60,500	71,400	27	40.5	7.83	170

The following simple demonstration proves that elements incorporated in the welding rod coating do alloy and mix with the base rod material: As you may know when a welding arc is struck, a bead of molten metal forms at the tip of the welding rod and then a series of small metal globules are projected across the arc to form the weld. Now in the case of a mild steel base rod with a manganese type coating, if the arc is broken and a magnet is applied to the globule of metal which remains at the electrode tip it will be found to be non-magnetic whereas the unmelted low-carbon base rod immediately adjacent to the globule is magnetic. This clearly shows a positive alloying action occurring in each drop of metal before it leaves the welding rod and further illustrates how basic raw materials in pre-determined quantities are alloyed in the arc to produce a steel of specific characteristics. This same principle may be carried out in depositing many other types of ferrous and non-ferrous alloys. Welding rods which deposit metal of rail steel hardness, or tool steel hardness or metal highly resistant to corrosion or metal of high strength and ductility may have the same base rod of low-carbon steel and differ only as to the coating ingredients.

The use of a low-carbon base rod and a heavy alloy coating affords additional advantages in the actual welding process. For example, in welding high-manganese steel it is advisable to keep the base or parent metal as cool as possible in order to avoid overheating of the parent metal. This is accomplished by the heavy refractory coating on the welding rod. It concentrates the heat at the welding rod tip so that it is possible to use a lower current than is usually necessary with bare alloy rods of similar diameter. Furthermore, welders generally recognize that an alloy rod does not produce the same degree of arc stability as a low-carbon steel rod. By using a low-carbon base rod and by introducing the alloying ingredients in the coating a greatly improved alloy-depositing welding rod is obtained which closely approaches the mild steel rod in arc stability.

Differences in weld metal characteristics between a test bar made with a high-grade bare welding rod and a shielded arc electrode are shown in the accompanying table.

Test for No. 1 was made with a high-grade bare, low-carbon steel welding rod. Test bar No. 2 was made under identically the same welding conditions and the same kind of base rod was used, only in this case the base rod was coated with a suitable shielded arc coating.

It will be noted that the yield point has been increased from 46,300 lb. to 60,500 lb., ultimate strength from 58,000 lb. to 71,400 lb. and the elongation from 6 per cent to 27 per cent in 2 in.

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General Offices—AMBRIDGE, PENNA.
Mills—AMBRIDGE, PENNA., and CHICAGO, ILL.

PLANT EXPANSION AND EQUIPMENT BUYING

NEW ENGLAND

State Department of Mental Diseases, State House, Boston, has plans for two-story addition to mechanical service building at institution at Belchertown, Mass., and one-story canning plant at same place. Cost $84,000 with equipment. Financing is being arranged. Kendall, Taylor & Co., 142 Berkeley Street, Boston, are architects.

Board of Selectmen, Sterling, Mass., plan manual training department in new junior and senior high school. Cost over $150,000. Frost, Chamberlain & Edwards, 390 Main Street, Worcester, Mass., are architects.

Samson Die Co., Inc., Salem, Mass., has been organized by H. Lewis Samson, 246 Fifth Avenue, New York, and associates, to manufacture dies and kindred products.

Roger Williams Brewing Corpn., 117 Friendship Street, Providence, R. I., has let general contract for new multi-story plant to Hope Building Co., Inc., 36 Exchange Street. Cost about $130,000 with equipment. Di Mitri & Di Mitri, 509 Westminster Street, are architects.

Barbrick Tool & Machine Co., Hartford, Conn., has been organized by John W. Barbrick and John L. Moran, 46 Shultas Place, to manufacture machinery and tools.

NORTH ATLANTIC

Fleischmann Distilling Corpn., Peekskill, N. Y., a subsidiary of Standard Brands, Inc., 595 Madison Avenue, New York, has work under way on two-story mechanical bottling plant, 80 x 300 ft. Cost over $100,000 with equipment.

Simplex Piston Ring & Motor Parts Co., Inc., New York, has been organized by Ralph W. Edson, 57 Herkimer Street, Brooklyn, and Edward A. Lovell, 46-09 193rd Street, Auburndale, N. Y., to manufacture automobile equipment.

Superintendent of Lighthouses, St. George, Staten Island, N. Y., asks bids until Nov. 13 for 407 tons of ¾ to 1⅝-in. wrought iron open link buoy chain; 3½ tons of 1¼-in. stud link iron lightship chain; 12,350 pieces (about 106 tons) wrought steel buoy shackles; 226 pieces (about 5½ tons) wrought iron buoy swivels; and three 5000 lb. cast steel mushroom anchors.

Metal Litho Corpn., 168 Thirty-ninth Street, Brooklyn, manufacturer of decorated sheet metal products, etc., has leased additional space in Bush Terminal for expansion.

American Commercial Alcohol Corpn., 405 Lexington Avenue, New York, has work under way on expansion and improvements in distillery at Pekin, Ill., to include additional machinery to double capacity. Cost over $400,000 with equipment.

Perfect Carton Opener Sales Corpn., New York, has been organized by Harry C. Kayser, 860 Park Avenue, Elizabeth, N. J., and Fred J. Schmidt, Pearl River, N. Y., to manufacture tools and appliances for opening cartons, boxes, etc.

Arma Engineering Co., 254 Thirty-sixth Street, Brooklyn, manufacturer of electrical instruments and equipment, has leased additional space in Bush Terminal for expansion.

T. J. Cronin, Watervliet, N. Y., manufacturer of automobile and motor truck bodies, has leased one-story building at 314 Ogden Street, Newark, N. J., for new plant.

Essex County Board of Freeholders, Hall of Records, Newark, is arranging financing for $165,000 for extensions and improvements in power plant and water system at Overbrook Hospital, Verona, N. J., with new generators and auxiliary equipment, pipe lines, etc. Runyon & Carey, 31 Fulton Street, are consulting engineers.

Distillers Products Corpn., 566 Hudson Avenue, Weehawken, N. J., Joseph C. Bender, president and general manager, plans new multi-unit distilling and blending plant. Company is arranging for stock issue of $525,000, par value shares, part of fund to be used for purpose noted. A smaller distillery is now being operated at Toronto, Ont.

Metropolitan Aircraft Corpn., Paterson, N. J., has been organized by Irving J. Rubin and R. H. Reiffin, 152 Market Street, capital $100,000, to manufacture airplanes and parts.

Schultz Brewing Co., Inc., recently organized by Frank Schultz, Martinsville, N. J., and associates, has arranged for purchase of former five-story brewery of Daniel Bermes, Inc., Park Avenue, Union City, N. J., with two- and four-story units adjoining, and will modernize for new plant. Cost over $125,000 with machinery.

United Brewing Co., Springfield and Morris Avenues, Newark, operating former Union Brewery, plans new bottling department, to be ready for service early next year. Cost over $45,000 with equipment.

Public Works Officer, Navy Yard, Philadelphia, asks bids until Nov. 14 for new shipways (Specification 7362); until Nov. 17, two storehouses and two magazines at Fort Mifflin, Pa. (Specification 7537); until Nov. 21, extensions and improvements in power plant at Marine Corps depot, Philadelphia (Specification 7500).

Charles Ritz, Jr., and William H. Ross, Philadelphia, have leased buildlings at 2326-28 North Fifth Street and 2331 North Reese Street for new brass and bronze foundry.

Board of Public Education, Eleventh and Washington Streets, Wilmington, Del., asks bids until Nov. 15 for new three-story and basement Pierre S. du Pont high school. Manual training department will be installed. Cost $1,500,000 with equipment. E. William Martin, du Pont Building, is architect.

BUFFALO DISTRICT

Niagara, Lockport & Ontario Power Co., Electric Building, Buffalo, plans new transmission line from Evans to Cascade Park, with high-tension power substation at Concord, N. Y. Cost over $50,000.

Village Council, Elba, N. Y., plans installation of pumping equipment and accessories, pipe lines, etc., for municipal water system. Cost about $50,000. Financing is being arranged. C. E. Elmendorf, Rochester, N. Y., is engineer.

Jewett Stove & Foundry Corpn., Tonawanda, N. Y., has been organized by Sherman S. and Kelsey H. Jewett, Military Road, to manufacture stoves, parts and kindred products. New company will succeed to Jewett & Co., manufacturers of similar specialties.

Consolidated Aircraft Corpn., 2050 Elmwood Avenue, Buffalo, will take bids soon on general contract for new plant on 20-acre tract at Lindbergh Field, San Diego, with main one-story unit, 300 x 500 ft.; hangar, 100 x 120 ft.; storage and distributing plant, 100 x 100 ft.; and two-story office, 40 x 300 ft. Cost over $500,000 with equipment. Present plants will be removed to new location and production concentrated there. Major Reuben Fleet is president.

WASHINGTON DISTRICT

Baltimore Pure Rye Distilling Co., Dundalk, Baltimore, has let general contract to Cogswell Construction Co., 406 Park Avenue, for new plant, including main five-story unit, 80 x 130 ft., and two one-story buildings, 69 x 70 ft. and 28 x 56 ft. respectively, with power house, 52 x 52 ft. Cost about $100,000 with equipment. C. H. Osborne, 222 West Franklin Street, is engineer.

Navy Department, Washington, has secured appropriation of $858,500 for relocation of naval radio station at Pearl Harbor, Hawaii, and installation of new equipment; $619,500 for similar program at naval radio station at Summit, Canal Zone, and $293,000 for modernization of naval radio station at Annapolis, Md., including equipment.

National Brewing & Distilling Co., Winchester, Va., recently organized by John Shine and M. E. Magee, Winchester, capital $250,000, plans new multi-story brewery. Cost over $150,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Nov. 29 for new two-story mechanical building at Pearl Harbor, Hawaii, Navy Yard, with 2-ton crane (Specification 7074); extension to storehouse, same yard (Specification 7085); new boiler plant and equipment at naval ammunition depot, Oahu, T. H. (Specification 7257).

International Fiber Machine Co., Keyser Building, Baltimore, has been organized by Thomas B. Athey, 3301 Elgin Avenue, and associates, to manufacture special machinery and parts.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids Nov. 14 for 500 oil fillers and 4600 oilers (Schedule 960) for Eastern and Western yards; three motor-driven, 16-in. swing, wood-working lathes (Schedule 1001) for Puget Sound yard.

OHIO AND INDIANA

Triplex Screw Co., 5317 Grant Avenue, Cleveland, manufacturer of screws, bolts, studs, etc., has plans for one-story addition, 60 x 140 ft. A. E. Roe, 1291 East 133rd Street, is engineer.

Hoster Brewing Co., 100 Eldon Avenue, Columbus, Ohio, recently organized by H. C. Tuller, Jr., and associates, will take bids soon on general contract for new eight-, five- and two-story plant. Cost over $250,000 with machinery. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Sanymetal Products Co., Inc., Cleveland, has been organized by Clyde J. Daugherty and Kent W. Benham, capital $75,000, to manufacture metal goods. Company will succeed to organization of same name with plant at 1705 Urbana Road.

Department of Public Service, U. B. Annex, Dayton, Ohio, H. H. Baker, director, plans new municipal incinerator and sewage treatment plant, to include pumping machinery and accessories, mechanical-handling equipment, etc. Cost about $100,000 with equipment.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Nov. 14 for 400 gun control switch assemblies, 400 gun control switch index plates (Circular 131); until Nov. 21, screws, trunnions, bolt assemblies, flexible landing gear retracting tube assemblies, eye bolts, strut eye bolts, etc. (Circular 127).

Carthage Distilleries Corpn., Carthage, Ohio, subsidiary of National Distillers Products Corpn., 52 William Street, New York, plans new eight-story storage and distributing plant, 100 x 270 ft., with bottling plant adjoining. Cost over $65,000 with equipment.

Village Council, McArthur, Ohio, plans installation of pumping machinery and other equipment, pipe lines, etc., for new municipal waterworks. Cost $60,000. Financing is being arranged. Burgess & Nipple, 568 East Broad Street, Columbus, Ohio, are engineers.

East Dayton Tool & Die Co., 310 East Second Street, Dayton, Ohio, has awarded general contract to P. K. Hart, 1244 Demphle Avenue, for one-story addition to machine shop, and improvements in present plant. Walter J. Thies, 3155 North Main Street, is architect.

WESTERN PENNA.

Superior Paper Products Co., Carnegie, Pa., manufacturer of corrugated boxes and containers, has let general contract to Rust Engineering Co., Koppers Building, Pittsburgh, for new plant in Robinson Township. Cost about $150,000 with equipment.

Schenley Distillers Corpn., Clark Building, Pittsburgh, is carrying out expansion and improvements at plants at Schenley, Pa., and Frankfort, Ky., and is rebuilding branch distillery at Lawrenceburg, Ind. Work is under way on new blending and rectifying plant, and bottling works at first noted plant. New equipment will be installed at all three plants. Cost over $500,000 with machinery.

Common Council, Fort Gay, W. Va., plans installation of pumping machinery equipment,

A Partial List of
DETROIT ROCKING ELECTRIC FURNACE INSTALLATIONS

AKRON BRASS · AMERICAN BRASS · AMERICAN CHAIN · ATLAS FOUNDRY
FORD MOTOR · BAKER-PERKINS · SHENANGO [illegible] MOLD · SKODA WORKS
BETHLEHEM SHIPBUILDING · FRAN[illegible] · CADILLAC MOTOR
CARONDELET FOUNDRY · [illegible] · BUICK MOTOR
CHEVROLET MOTOR [illegible] BRIDGEPORT BRASS
BUCKEYE [illegible] MASSEY-HARRIS
BURMEIS[illegible] PHITE & BRONZE
COCHRAN[illegible] CONSOLIDATED
ROLLING M[illegible] ATOR · CRANE
EATON-ERB [illegible] · STANLEY
CITROEN · [illegible] FURUKAWA
MINING CO. · [illegible] INNESOTA
GENERAL RAILW[illegible] COMPANY
GENERAL BRONZE [illegible] OUNDRY
INGERSOLL-RAND [illegible] CABLE
KENNEDY VALVE [illegible] METAL
CHAPMAN VALVE · [illegible] MICH.
STEEL CASTING · MI[illegible] & SONS
MUELLER · JAMES MC[illegible] EPTUNE METER
OHIO BRASS · OBERDORF[illegible] AN · PENNSYLVANIA R.R.
PERFECT CIRCLE · PHELP[illegible] INTERNATIONAL NICKEL · WM.
POWELL CO. · SULLY BRAS[illegible] NDRY · D. J. RYAN FOUNDRY · SCHNEIDER
COMPANY—RILEY STOKER CORP. · BATTELLE MEMORIAL INSTITUTE · FIAT
STANDARD BRASS · REVERE COPPER & BRASS · TEXTILE MACHINE
WORKS · U. S. NAVY · JENKINS BROS. · KOHLER · PACKARD MOTOR
GENERAL ELECTRIC · WAGNER ELECTRIC · WALWORTH · WESTERN
ELECTRIC · WESTINGHOUSE AIR BRAKE · WESTINGHOUSE ELECTRIC & MFG.
WHEELING & LAKE ERIE RY. · WOLVERINE BRASS · WORTHINGTON PUMP
MOORE DROP FORGING · YALE & TOWNE · YORK ICE MACHINERY

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DETROIT ELECTRIC FURNACE CO.

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filter and other equipment, pipe lines, etc., for municipal waterworks. Cost $45,000. Financing is being arranged. J. Paul Blundon, Keyser, W. Va., is consulting engineer.

Insulated Steel Houses, Inc., Kanawha City, W. Va., recently organized by Alvin MacCorkle, Union Trust Building, Charleston, W. Va., and associates, plans establishment of steel fabricating plant for production of steel building sections, also storage and distributing plant.

SOUTH ATLANTIC

Tampa Shipbuilding & Engineering Co., Tampa, Fla., has plans for new shipbuilding and repair plant, including 10,000-ton dry dock, machine shops, wood-working and mechanical shops, power station and other units. Cost $750,000 with equipment. Federal loan was recently secured in such amount. Max Kreher is secretary and treasurer.

City Council, Macon, Ga., plans installation of electric generator and accessories, pumping machinery and other equipment for waterworks filtration system. Cost $36,000. Financing has been arranged.

Mount Olive Mfg. Co., Mount Olive, N. C., manufacturer of wire-bound barrels, kegs, etc., plans rebuilding part of plant recently destroyed by fire. Loss about $50,000 with equipment.

Atlanta Cotton Oil Co., Atlanta, Ga., plans rebuilding storage and distributing plant recently destroyed by fire. Loss about $75,000 with equipment.

SOUTH CENTRAL

Buffalo Springs Distillery Co., Buffalo Springs, Ky., plans extensions and improvements, including new buildings and equipment. Cost over $100,000 with machinery. Walter C. Wagner, Breslin Building, Louisville, is architect and engineer.

Superintendent of Lighthouses, New Orleans, has secured low bid from R. P. Farnsworth & Co., city, for one-story machine shop and mechanical building, 61 x 150 ft., forge and carpenter shop, 50 x 80 ft., and gas and oil building, 40 x 40 ft., at Choctaw Point, near Mobile, Ala., at $46,654, exclusive of equipment.

East Jefferson Water District, Kenner, La., plans extensions and improvements, including main trunk and distributing pipe lines, pumping machinery and other equipment. Cost $390,000. Financing is being arranged. H. A. Mentz, Hammond, La., is engineer.

K. Taylor Distilling Co., Inc., formerly known as Franklin County Distilling Co., Inc., has acquired former Frankfort Distillery, Forks of Elkhorn, near Frankfort, Ky., and plans expansion and improvements.

Cummins Distillery Corpn., Louisville, Arthur J. Cummins, 2229 Valley Vista Road, head, is arranging fund of about $150,000 for extensions and improvements in former Atherton Distillery, Athertonville, Ky., including additional machinery. Power house will be rebuilt, with new boilers and other equipment. W. C. Wagner, Breslin Building, Louisville, is architect.

SOUTHWEST

Joseph T. Ryerson & Son, Inc., 2208 North Second Street, St. Louis, iron and steel products, with headquarters at Chicago, has asked bids on revised plans for one-story addition to storage and distributing plant, with two-story office building adjoining. Cost about $85,000 with equipment.

Board of Education, Library Building, Kansas City, Mo., plans manual training department in new three-story and basement high school, 180 x 260 ft., for colored students. Cost $620,000 with equipment. Financing is being arranged. Charles A. Smith, Finance Building, is architect; N. W. Downes, Finance Building, is mechanical engineer.

Town Council, Rector, Ark., plans new municipal electric light and power plant. Cost about $79,000 with equipment. Federal loan is being arranged.

Common Council, Belton, Mo., is arranging financing for $60,000 for new municipal electric light and power plant and distribution system. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Harry Mitchell Brewing Co., El Paso, Tex., care of Trost & Trost, El Paso National Bank Building, architects, has plans for new brewery, with main brew-house, bottling works, storage and distributing buildings, power house and other structures. Cost about $275,000 with equipment. It is proposed to have plant ready for service early next year. Metcalf & Richards, Inc., Liberty Trust Building, Philadelphia, is engineer.

Byrd Air Cooler Co., Waxahachie, Tex., has been organized by R. J. Byrd and W. H. Cody, Waxahachie, capital $150,000, to manufacture mechanical cooling devices and equipment.

City Council, Trenton, Mo., has called special election on Nov. 14 to approve bonds for $250,000 for a municipal electric light and power plant, and distributing system. W. E. Ralls, Trenton, is engineer.

MICHIGAN DISTRICT

Irish Hills Distillery, Inc., Northville, Mich., recently organized, care of C. Howard Crane, Inc., 112 Madison Street, Detroit, architect, plans new distillery. Cost over $80,000 with equipment. Walter Schweikert is president.

Aerseel Co., 1114 Buhl Building, Detroit, has been organized by Charles E. McCormick, 1723 Houstonia Avenue, Royal Oak, Mich., and associates, to manufacture automobile parts and equipment.

Benton Harbor Fruit Association, Benton Harbor, Mich., plans installation of refrigerating and cold storage plant in new fruit storage and distributing plant, with mechanical-handling and packing machinery. Cost about $100,000 with equipment. Don Lakie, Grand Rapids, is architect.

City Council, Dowagiac, Mich., has engaged Norris-Ayers, Inc., Ann Arbor, Mich., engineer, to draw plans for new municipal electric light and power plant. Cost about $200,000 with equipment.

Weldex, Inc., 9666 East Jefferson Avenue, Detroit, has been organized by William R. Evans, 2046 Penobscot Building, and associates, to manufacture electric welding machines and parts.

MIDDLE WEST

Atlas Brewing Co., 2107 Blue Island Avenue, Chicago, plans extensions and modernization of main brew-house and washhouse, including equipment. New storage and distributing units will be built. Cost over $400,000 with machinery. Shattuck & Layer, 221 North LaSalle Street, are architects.

Armour & Co., Union Stock Yards, Chicago, have let general contract to Service Construction Co., Indianapolis, for two-story addition to packing plant at Indianapolis. Cost about $100,000 with equipment.

Barton Mfg. Co., 201 North Wells Street, Chicago, has been organized by R. M. Bristol and William E. Yaxley, to manufacture metal products.

Minnehaha Brewing & Malting Co., Sioux Falls, S. D., F. C. Whitehouse, secretary, plans new multi-unit plant, for which site is being selected. Cost over $100,000 with equipment.

Board of Education, Dickinson, N. D., plans manual training department in new high school. Fund of $160,000 is being secured. W. F. Kurke, 545 Broadway, Fargo, N. D., is architect.

United States Engineer Office, First District, 333 North Michigan Avenue, Chicago, asks bids until Nov. 22 for five standby gasoline-electric power units, each 125-kw. capacity, at locks at Lockport, Brandon Road, Starved Rock, Dresden Island and Marseilles, Ill., respectively.

K. O. Lee & Son Co., Aberdeen, S. D., manufacturer of motor tools, tractor accessories, etc., has plans for new two-story and basement machine shop, 126 x 180 ft., to be erected early next year. It will replace a unit destroyed by fire. Cost about $75,000 with equipment. K. M. Fullerton, Shubert Building, St. Paul, Minn., is architect.

Tivoli Union Brewing Co., 1342 Tenth Street, Denver, has let general contract to F. J. Kirchhof Construction Co., Lawrence Building, for two-story addition, 35 x 50 ft., and power house, 41 x 45 ft., including improvements in present plant. Cost about $50,000 with equipment. J. K. Monroe, Lakewood, Colo., is architect.

Denmark Brewing Co., Denmark, Wis., has been incorporated with $100,000 capital stock by Gilbert Sundstrom, Frank X. Warm and Edward Pelishek and is erecting new brewery costing $50,000. Inquiry is being made for equipment.

Medford Brewery Co., Medford, Wis., has started work on first unit, 40 x 102 ft., two stories and basement, of new brewery, and has plans for second unit to be built early next spring. Richard Seuberlich, Plymouth, Wis., is president. E. A. Stubenrauch, Sheboygan, Wis., is architect.

Rusk County Board, Ladysmith, Wis., will start work soon on L-shaped machine shop and garage, 60 x 120 and 40 x 50 ft., for County highway department. Cost about $30,000 with equipment. Elmer Hill is County clerk.

Milwaukee Road, Milwaukee, plans rebuilding locomotive and car repair shops at Deer Lodge, Mont., recently destroyed by fire. Loss over $100,000 with equipment.

Big Horn-Black Hills Power Association, Spearfish, S. D., D. W. George, secretary, is arranging financing for new central power plant for electric light and power service near Gillette, Wyo., in Black Hills and Big Horn Mountain districts, with transmission and distributing lines. Cost $8,217,000. Frank I. Sontar, Spearfish, is engineer.

PACIFIC COAST

Eldorado Brewing Co., 626 North American Street, Stockton, Cal., will soon begin superstructure for new four-story brew-house. Cost about $100,000 with equipment. C. M. Fraenkel, 461 Market Street, San Francisco, is architect.

City and County of San Francisco, City Hall Civic Center, San Francisco, has secured Federal loan of $1,400,000 for initial work for new hydroelectric generating plant in Tuolumne County, with transmission lines in Alameda, San Francisco and San Mateo counties, power substations, etc. Station will have ultimate capacity of 200,000 kw., and will cost over $5,000,000. Department of Electricity, address noted, in charge.

Grass Valley High School District, Grass Valley, Cal., plans new one-story vocational training shop at school. Frederick H. Reimers, 233 Post Street, San Francisco, is architect.

Board of Trustees, Washington State College, Pullman, Wash., is planning new power house for central heating and power service. Cost $258,000 with equipment. Work will be carried out in connection with building program at institution to cost $825,000, for which financing is under way.

Ben Lomond Winery, Santa Cruz, Cal., recently acquired by new interests, headed by I. H. Rice, San Francisco, and others, plans extensions and improvements, including new equipment. Cost over $30,000 with equipment. A second unit is planned early in 1934. Joseph Hill will be in charge of building.

American Metal Rolling Corpn., Los Angeles, has been organized by Lee T. Sepin and E. C. Hummel, represented by Austin C. Sherman, 411 West Fifth Street, to manufacture metal products.

Board of City Trustees, Morgan Hill, Cal., plans installation of pumping machinery and other equipment, pipe lines, etc., for municipal water system. Cost $45,000. C. C. Kennedy, Call Building, San Francisco, is engineer.

American Foundry Co., Seattle, has been organized by Sumner K. Prescott and J. P. Jensen, represented by Bogle, Bogle & Gates, Central Building, to manufacture iron and other metal castings, and operate a machine shop.

FOREIGN

Charles Turner (Scotland), Ltd., Irvine, Ayrshire, Scotland, manufacturer of oil products, plans new coal distillation plant for production of lubricating and other oils, bituminous wax, etc. Initial unit will comprise 21 retorts, storage and distributing buildings, tank house, power house and other structures. Cost over $500,000 with equipment.

Pierce Petroleum Co., Tampico, Mexico, is considering rebuilding local oil refinery, recently damaged by hurricane. Loss over $125,000 with equipment. Headquarters are at 120 Wall Street, New York.

Sulphide Corpn., Ltd., Seaton-Carew, England, has approved plans for expansion in zinc oxide works, including additional equipment. Cost over $100,000 with machinery.

Imperial Chemical Industries, Ltd., London, England, is considering new plant for manufacture of building blocks, plasterboard and kindred building products, using raw materials from mining properties at Billingham, England. Cost about $150,000 with equipment.

GALVANIZED GOLD

... TO YOU

WHEN YOU BUY galvanized sheet metal for any purpose, you pay for it in *gold* or its equivalent. Perhaps you have never looked at it in quite this way; but it explains better than anything else why Armco Galvanized Sheets are known for their "good-as-gold" qualities.

The base metal, whether rust-resisting INGOT IRON or good Armco Steel, is as clean and uniform as the latest refining and continuous rolling methods can make it. That means ease of fabrication—and endurance. The zinc coating is heavy, even and adherent. Sheets form easily and surely and are well protected for lasting service.

You can choose the most appropriate and thrifty grade of galvanized sheet for your express purpose—Armco INGOT IRON, steel or copper-bearing steel, in either the bright-spangled or "Paintgrip" finishes. "Paintgrip" is a boon to products or construction that must be painted soon after forming.

In addition there are several different styles of roofing made from Armco Galvanized Sheets. About these or any of the flat grades we shall be glad to give you the buying facts. Just send your inquiry to our nearest office.

THE AMERICAN ROLLING MILL COMPANY

Executive Offices: Middletown, Ohio

TUNE IN ARMCO PROGRAM
N.B.C. BLUE NETWORK
FRIDAY NIGHT, 10.00 E. T.; 9.00 C. T.

ARMCO

ARMCO INGOT IRON galvanized flat and corrugated sheets have full-weight coating applied to uniform, refined iron base.

ARMCO COPPER-BEARING STEEL galvanized sheets are supplied in all standard sizes and gages. Even, heavy coating on durable base.

ARMCO STEEL GALVANIZED sheets offer exceptionally good quality at moderate cost. Full coating on clean steel.

ARMCO PAINTGRIP galvanized sheets supplied in both INGOT IRON and steel grades. Paint and lacquers adhere tightly without pre-treatment. Full-weight coating assured on all grades.

Get the *Right Grades* For Exacting Needs

Ford Makes Starters and Generators in Model Small Plant

(*Concluded from Page* 14)

hooked up to the conveyor. Twenty-eight hundred generators are tested in this manner every eight hours. Each generator is on the test conveyor 25 min.

Commutator Bars Rolled in One Pass

V-shaped copper commutator segment bars are rolled in one pass in a long strip in a special continuous rolling mill designed by Ford engineers. This mill rolls ¼ x 1-in. bars at the rate of about 22 ft. per min. It consists of four sets of rolls, each of which is driven by an individual motor. Each motor is of the slip-ring type arranged for variable speed.

In operation, the bar passes successively through each set of rolls, but if each roll is not adjusted perfectly, a loop forms between the rolls due to the stretch of the material. This loop is made to pass between two small rolls which in turn are connected to a limit switch. If, because of successive stretching between each roll, the loop grows too large, it operates a limit switch speeding up the motor. This increases the speed of the rolls with the result that the size of the loop is diminished. When the loop has reached an almost straight position, the limit switch again operates, reducing to normal the speed of the motor.

All of the electrical equipment of the mill, except switches and motors, is located in the base and is accessible through large doors. The rolls are adjustable by micrometer screws and are separated by means of hardened and ground wedges which hold them in a rigid position when adjustments are made. The rolls are 10 in. in diameter and are mounted on 5-in. shafts. Spindles are hardened and ground, and are provided with tapered bearings. The shafts for carrying the rolls have outboard bearings which may be removed readily for replacing of rolls. The mill is equipped with an automatic oiling system.

As the strip of copper emerges from the rolling mill, it passes into a press where the generator commutator segment is blanked. One operator attends both the rolling mill and the press.

The commutator V-ring is formed in a 145-ton single-action press in what is equivalent to a cold coining operation. The press, equipped with a rotary die, has a fixture containing 80 stations. Two stations are in the die simultaneously with two operations, consisting of a pre-form and a final form, being performed in each station. The press runs at the rate of 40 strokes per minute. Except for loading, the entire operation is automatic.

An automatic starter field coil winding machine is one of the most unique and efficient machines in the plant. Tinned copper wire is taken off a reel into the machine where the lead is bent and a loop formed. The wire is pushed 12 in. on to a winding arbor, which starts revolving slowly at the same time that special paper is fed on to the wire form. During the ninth and final revolution, the machine cuts the wire automatically. The machine winds 2500 coils of wire every eight hours.

Differing somewhat from this machine is an automatic generator field coil winding machine. It starts into action slowly, the arbor picking up speed and then slowing down, making a total of 99 turns. When the arbor stops revolving, the wire is cut and two jaws come up and seize the coil on each side. At the same time the arbors open up, allowing the coil to descend and the jaws to retreat to the coil winding position. When the arbor starts its cycle again, an arm comes down automatically and lays the coil in a position to be wrapped with gum paper. The wrapping process is automatic.

Working conditions in the Ypsilanti plant are as near ideal as modern engineering can make them. All air is washed as it enters the building, special equipment consisting of two 50-hp. motors and two blowers having been installed for this purpose. The roof has special insulation to keep out both heat and cold. Thus the temperature is maintained at a comfortable level the year around. While equipment is close enough together to secure efficient manufacturing results, it is not crowded so as to endanger the workmen or cause physical discomfort.

How Attractive Finish Helps Metal Products Sales

(*Concluded from Page 19*)

in a group of varnish and paint experts and pointed out the necessity of developing a quicker-drying enamel. He told them how expensive it was to delay production of automobiles because of the slow finishing process. This, he said, tied up an immense amount of capital and also the slow drying meant added danger of dust collecting, and this in turn meant an added expense for closely sealed drying rooms. He told the group that he wanted them to give him a quicker-drying enamel which would have fully as good an appearance as the regular 48-hour enamels. After a good deal of work in many laboratories, the experts returned and said they had succeeded and when Mr. Kettering asked them how quickly the new product would dry, they rather jubilantly told him "twenty-four hours," or just half the previous time. Instead of being pleased, however, Mr. Kettering was greatly disappointed and told them that they hadn't even started on the problem. When asked how quickly he thought the finish should dry, he replied: "In one hour." This seemed utterly impossible to the leading paint and enamel experts at the time, but a group of chemists and others, less bound by the traditions of the varnish industry, has since fully met Mr. Kettering's forecast with a lacquer which dries within an hour.

Interior of 14-Mile Pipe Line is Sandblasted

W. W. SLY MFG. CO., Cleveland, recently furnished to the Water Department of the City of Los Angeles, sandblast equipment to automatically clean the inside and outside of steel water pipe.

These pipes are from 7 to 8 ft. in diameter, made out of steel plate up to 1-1/16 in. thick. These pipes are for one of the main lines of water supply for the City of Los Angeles.

The purpose of the sandblasting of these pipes is to remove from the steel all impurities such as dirt, rust, mill scale, etc., in preparation for the application of a rust preventing paint.

This is the largest job ever attempted as to size of pipe as well as length of total pipe line. The pipe is made up in sections of 20 ft., 27 ft., and 30 ft. long, and the total main being under construction now is approximately fourteen miles long. This involves the cleaning by sandblast of a total surface of over two million square feet.

Use STAINLESS Steel
to Protect and Improve Your Product

PRICE No Longer Stands in Your Way!

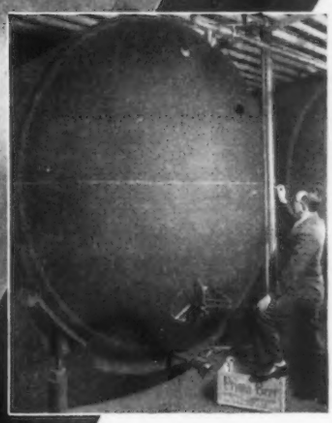
-a BORG-WARNER product

By cladding inexpensive mild carbon steel with finest quality stainless steel, we give you a solid sheet or plate with an exposed or contact surface that has all the corrosion and acid-resisting qualities of solid stainless. About one-fifth of the sheet or plate is stainless—about four-fifths is cheaper steel. The result is stainless steel service in your product or in your plant at about *half* stainless cost. This sensational new development in steel is known as—

(Trade Mark Reg.) **INGOCLAD**

STAINLESS-CLAD STEEL

Made by the Ingersoll Ingot Patented Process



One of a battery of three IngOclad U. S. Government measuring beer tanks, each 150 barrel capacity, installed in the Prima Brewery, Chicago. Built by Hamler Boiler & Tank Company, Chicago, Ill.

The inseparable bond that unites the two steels in IngOclad has its beginning in the casting of the ingot. Here the molten metals are combined before rolling into the desired sheets or plates. This process is covered by U. S. Patents and is the secret of the sensational success of IngOclad. So perfect is the union of the two metals that IngOclad may be formed, drawn, spun, beaded, brazed, soldered and fabricated to meet the particular requirements of any industry.

One of a group of shower bath compartments of IngOclad, built by Fiat Metal Manufacturing Company, Chicago, for a state institution.

Users and Fabricators

of equipment for the Food Industry, Chemical Industry, Drug Industry, Paper Industry, Dairy Industry, Beer and Beverage Industries, etc., are especially invited to investigate the protection and economies that IngOclad offers.

Milk Tank Truck, 3,000 gal. single compartment, made from IngOclad. Built by Alloy Products Corporation, Waukesha, Wis.

INGERSOLL STEEL & DISC CO.

(A DIVISION OF BORG-WARNER CORPORATION)

Specialists in High Carbon, Alloy and High Speed Steel and Stainless-Clad Sheets

310 S. MICHIGAN AVE., CHICAGO, ILL.

Plants: Chicago, Illinois, and New Castle, Indiana

A Power Famine—Fact or Fiction?

(*Concluded from Page* 15)

out and are replaced with more efficient equipment, the same as any other mechanical apparatus. To assume that total sales of appliances resulted in a comparable increase in connected load is to assume something which is contradicted by common sense. An estimate of over 10 million kw. increase in lighting load was made on the basis of sales of lamps approximating 20 million kw., using a 50 per cent replacing factor. Although it is exceedingly difficult to estimate what percentage of lamps purchased are used for replacement, there are certain factors which would tend to show that not only has the percentage been much larger than 50 per cent, but also that there are excellent grounds for the contention that the actual number of light bulbs in use have decreased. It has been estimated that the average life of a lamp used for domestic purposes is about three years, and that of a lamp used for industrial purposes about one year. In view of this it would seem that approximately 50 per cent of the lamps sold over a three year period were purchased for the replacement of lamps purchased during that three year period, without including sales of lamps to replace those previously in use. In fact, it is difficult to see how we could have any appreciable increase in the number of lamps at all in the face of practically no residential or factory construction, a decline in the amount of current sold and a decrease in the sale of lamps.

In the light of the foregoing it would seem reasonable to question the estimate of 42 million kw. additional connected load and by the same token the estimated additional capacity of over four million kw. needed to take care of this load. This being true we come to the inevitable conclusion that since 1929 the electrical utilities have expanded their capacity at a faster rate than the amount of new equipment put into service would require, and by the same token it would be true that the electric light and power industry is in an even better position to supply demands for current than it was in 1929.

A Sufficient Supply Is Available

It is, therefore, obvious that unless fundamental conditions have changed so as to create heavy demands for electricity during particular times of the day, a sufficient supply of electricity is available for all possible means within the near future. At the present time the total output of electricity is at the rate of approximately 30 per cent of the total available output. In 1929 over 37 per cent of the available output was made use of. It is the contention of those who predicted a power famine that we shall not be able to make use of over 30 per cent of our available output under present conditions and thus we are faced with an immediate power shortage. These changed conditions are largely attributed to the working of the NRA which seriously restricts overtime work.

That the NRA will have a tendency to increase peak loads placed on central stations does not seem to be borne out by a careful consideration of the conditions which are likely to be encountered. That the NRA does tend to concentrate industrial production and, therefore, the use of industrial electricity within the normal working day is undenied. That this will result in higher demands for current at a given time, and thus reduce the percentage of the total capacity which can be made available, is not so clear. Ordinarily in times of good business, when industries worked overtime, a large portion of this overtime work was done between the hours of 5 p. m. and possibly 10 or 11 p. m. This combined with a large lighting load encountered during these hours resulted in large demands for power. If the normal working time is to be confined from say 8 a. m. to 5 p. m., it does not necessarily mean that there will be larger loads at particular times of the day as compared to those previously encountered. Indeed, the reverse may be true, due to the fact that in many industries work will stop at 4 or 4:30 p. m., and thus reduce the heavy demand for current around 5 o'clock when the utility companies must furnish current for both a large industrial use and for lighting purpose under present conditions.

In this connection it may be interesting to note the experience of a large company serving a metropolitan area. Whereas peak loads of from 85 to 90 thousand kw. were encountered previous to 1930, at the present time the normal peak loads encountered are between 55 and 60 million kw., a reduction in peak loads of over 33 per cent. At the same time the amount of current sold to industrial concerns by this company dropped by only 13 per cent from August, 1929, to August, 1933, and total sales declined even less.

It is very possible that this decrease in peak load may be accounted for by the more careful use of the electricity made available to industrial concerns. A part of the bill of many industrial users is based upon the maximum demand. Along with other attempts to cut costs the manufacturer has given this factor considerable attention and has found that by the schedule of intermittent use equipment and by the use of automatic control equipment he has been able to radically lower his maximum demands. By these methods the manufacturer not only cuts down his own bills but at the same time reduces the amount of plant capacity which the public utility must have available to serve him.

The Power Factor Element

Another of the more important considerations bearing on the ability of utility companies to meet demands which may be placed upon them is the power factor element. Without going into a technical discussion of power factor it may be said that the presence of low power factor conditions in industrial plants requires additional power plant capacities over and above that needed to supply the actual working power. Low power factor conditions largely arise out of the use of induction motors at less than full loads. One of the results of the depression has been to cause manufacturers to pay closer attention to their power bills and to their investments in electro-motive equipment. This has resulted in many cases in the replacement of oversized motors with ones of smaller horsepower. These replacements, along with other more efficient equipment, and power factor corrective equipment have had a tendency to improve the power factor conditions.

Summarizing the arguments tending to show that the electrical industry is able to meet any demand which is likely to be placed upon it, it is seen that:

(1) The additions to plant capacities made by utility companies since 1929 have been very large in relation to general economic conditions.

(2) Estimates of the connected load added to the lines since 1929 are subject to considerable conjecture and in general have probably been much too high.

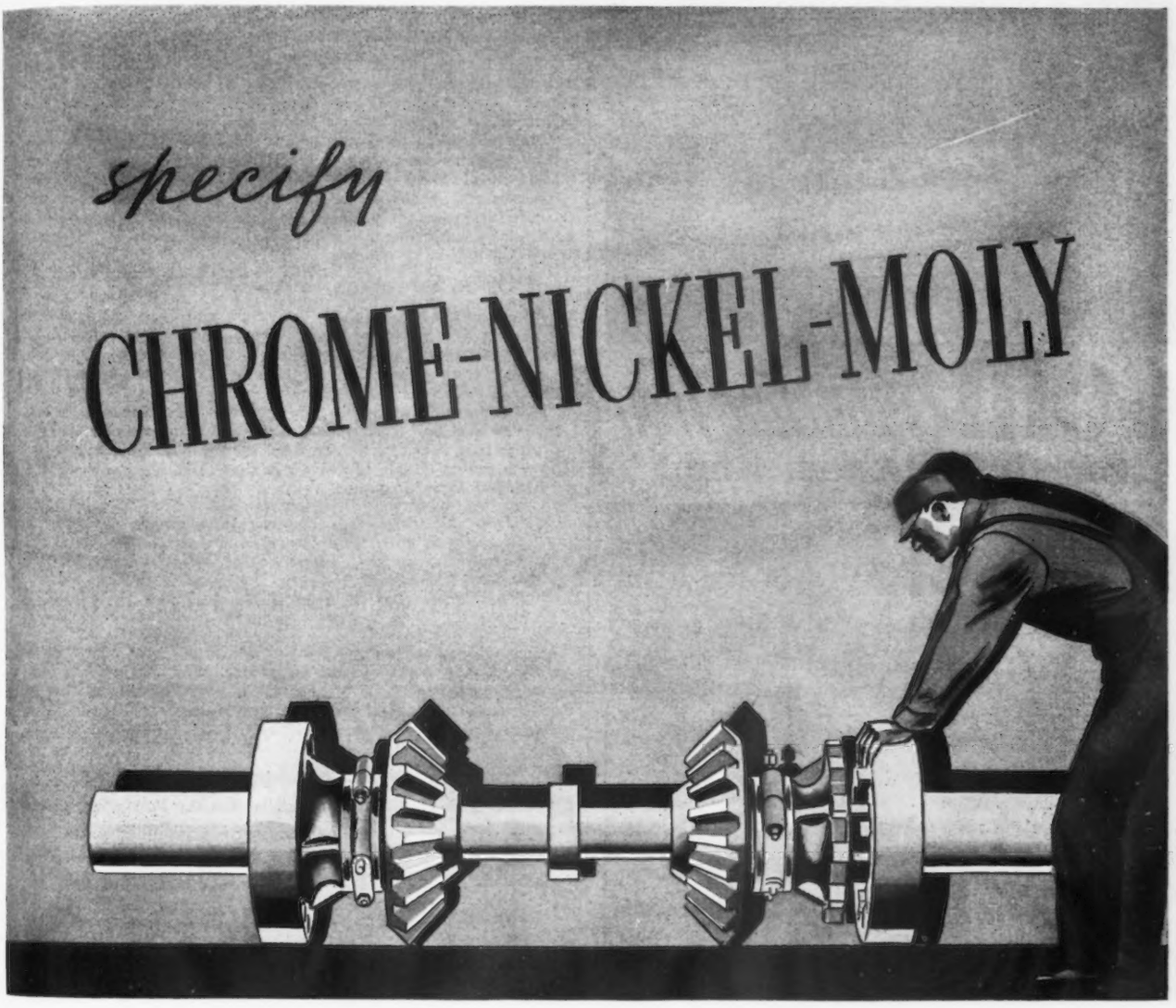
(3) There has been no change nor will there likely be any change in fundamental conditions which would result in making unavailable any larger portion of our total available output than was not available in pre-depression times. In fact, indications point to an even greater use of available output.

(4) Maximum demands of industrial companies have declined faster than their use of electric current due to pressure placed upon them to cut power costs. A large part of these declines probably will be maintained in the face of increased production by these companies.

(5) In general, power factor conditions have been improved during the depression which has resulted in the release of a portion of station capacity which previously had not been available for actual power production.

In the light of the foregoing it would seem that predictions of a power famine are a bit premature and it is extremely unlikely that there will be any such shortage of electric power generating capacity as to cause utility companies to place any burdensome restrictions upon users of electricity for industrial purposes.

TO PREVENT PART FAILURES WITHOUT CHANGING DESIGN



CHROME-NICKEL-MOLY is an outstanding steel for withstanding extreme torsional loads. It has unusual capacity for flowing torsional stresses until they are evenly distributed. Hence, failures are rare.

It is frequently specified where additional strength of a part is required without adding to size or weight, or where the expense of redesigning would be prohibitive.

Chrome-Nickel-Moly, despite its superior physical qualities, presents no unusual machining difficulties. In fact, it cuts as freely as the ordinary Chrome-Nickel steels of lower strength.

Complete information and counsel on the use of Chrome-Nickel-Moly may be had from our metallurgists.

Chrome-Nickel-Moly requires the most careful control of rolling temperatures. Ingot sizes must be adjusted to the size of the individual heat. Cooling and finishing temperatures must be rigidly controlled. In short, special facilities, special techniques, special skill are required. Many exacting manufacturers can testify to the dependable and uniform quality of Illinois Steel Company's Chrome-Nickel-Moly.

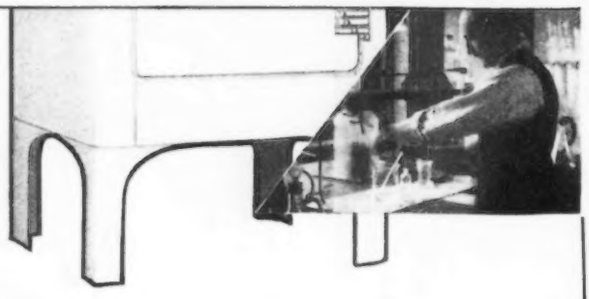
Illinois Steel Company
Subsidiary of United States Steel Corporation
208 S. La Salle Street, Chicago, Illinois

U·S STEEL

ILLINOIS *alloy* STEEL

ALWAYS DEPENDABLE

GOHI *Enameling Iron*
for all fine enameling..



THE country's leading enamelers testify that GOHI Enameling Iron is made to meet the exacting demands of the porcelain enamel industry.

Because of the purity and satiny surface of GOHI Enameling Iron, fine enameling practice is reflected in perfect finished products.

Where exceptional forming or drawing qualities are essential GOHI Enameling Iron is the one logical choice.

"It's the base metal that counts in the finish."

THE
NEWPORT ROLLING MILL CO.
NEWPORT . . . . . KENTUCKY

JUST BETWEEN US TWO

The Professor Confuses His Classes

IN his latest best-seller, Prof. Walter B. Pitkin, that hard-work-dasher-off of light-weight but popular books, remarks that one of the ways he conserves his energy is by refusing to open matter that comes to him by second-class mail.

You mean *third class,* don't you, Prof? If you don't, then that six bucks you sent us for a subscription not so long ago comes under the heading of charity.

Shame on you for not knowing that the post office accepts at second-class rates only those publications *actually ordered and paid for* by subscribers.

"Let Us Be Sweethearts Again"

WE see by the papers that Uncle Sam and Ivan are thinking of letting bygones be bygones. If so, Iron Age advertisers who make goods Russia needs are going to be versts and versts ahead of myopic competitors. For if there is a trade paper that's aces high in U.S.S.R. it's the Age.

If you can find an up-and-coming Soviet trust, factory, technical school or buying organization, interested in metals or metal-working, that doesn't get Iron Age, the milk shakes are on us.

It was only a couple of years ago that the *Chicago Daily News* carried this cable dispatch:

> *"Anne Kaneneva superintends laboratories, schools, propaganda work and libraries. In the latter she is permitting, among American periodicals, only the Nation, American Mercury, Harvard Law Review, Wall Street Journal, Iron Age and a few socialistic papers."*

Much water has flown under Volga bridges since that time and we doubt that Anne is still in power. But judging from the subscription list the situation has not changed as far as The Iron Age is concerned. So if you want entree in U.S.S.R., run, do not walk, to the nearest Iron Age office.

Mr. Popoff Provides an Appropriate Period

HERE'S The Iron Age routing list for the Polytechnical Institute, Leningrad:

E. Dobrzinsky, Chief Librarian
Dr. Pavloff, Dean
Dr. Neznanoff, Professor
Dr. Menshutkine, Professor
Dr. Beljankine, Professor
Dr. Shisokine, Teacher
Mr. Karnauhoff, Teacher
Mr. Oknoff, Teacher
Mr. Shulz, Teacher
Mr. Shewahne, Teacher
Mr. Chisolewsky, Teacher
Mr. Scirowsky, Teacher
Mr. Griaznoff, Assistant
Mr. Alekzeoff, Assistant
Mr. Popoff, Assistant

Could there be a more appropriate name to sign off with than Popoff? But enough of that lightheadedness. When the proteges of Doctors Pavloff, Neznanoff, Menshutkine, et al., matriculate and start buying the equipment to fulfill Russia's industrial destiny, will they or will they not favor those firms whose acquaintance they made in the good old days at "Polytech"?

We Violate the Morse Code

MAYBE it isn't the longest telegram on record, but it ran about 4,000 words, tied up the Pittsburgh-New York wire from 3:30 to 4:15 P.M. on Tuesday, Oct. 17, and will raise heck with the "Telegrams and Postage" item in our October budget. This is how it was:

Ernest T. Weir, National Steel head, was called to Washington by the Labor Board to sit in on a closed meeting regarding the Weirton-Clarksburg strike. Nothing was released to the press until Tuesday morning, and even then the newspaper accounts were vague and confused.

As this was a key case, of immense importance to all industry because of its bearing on the open shop issue, we phoned our Pittsburgh editor, "See Mr. Weir and try to get his statement to the Labor Board."

He got it, wired it to us, very nearly using up all of Western Union's dots and dashes. Thirty-eight hours later it was in your hands (page 50, Oct. 19 IA). Some service, eh, boss?

Our Sex Appeal Soars

THANKS, Baldwin-Southwark, for the sex appeal you added to our Oct. 26 issue by that girl photo you used in your ad on page 73. She's pretty and ties in nicely with the copy . . . The editors say that tough-looking steam fitter on page 17 of the same issue is smiling because the wrench has a fancy handle. We claim he's laughing . . . Humor in advertising is a tricky thing. Hard to handle. A bouquet to Carnegie for using it cleverly and effectively on page 91 of Oct. 19 IA.

—A.H.D.